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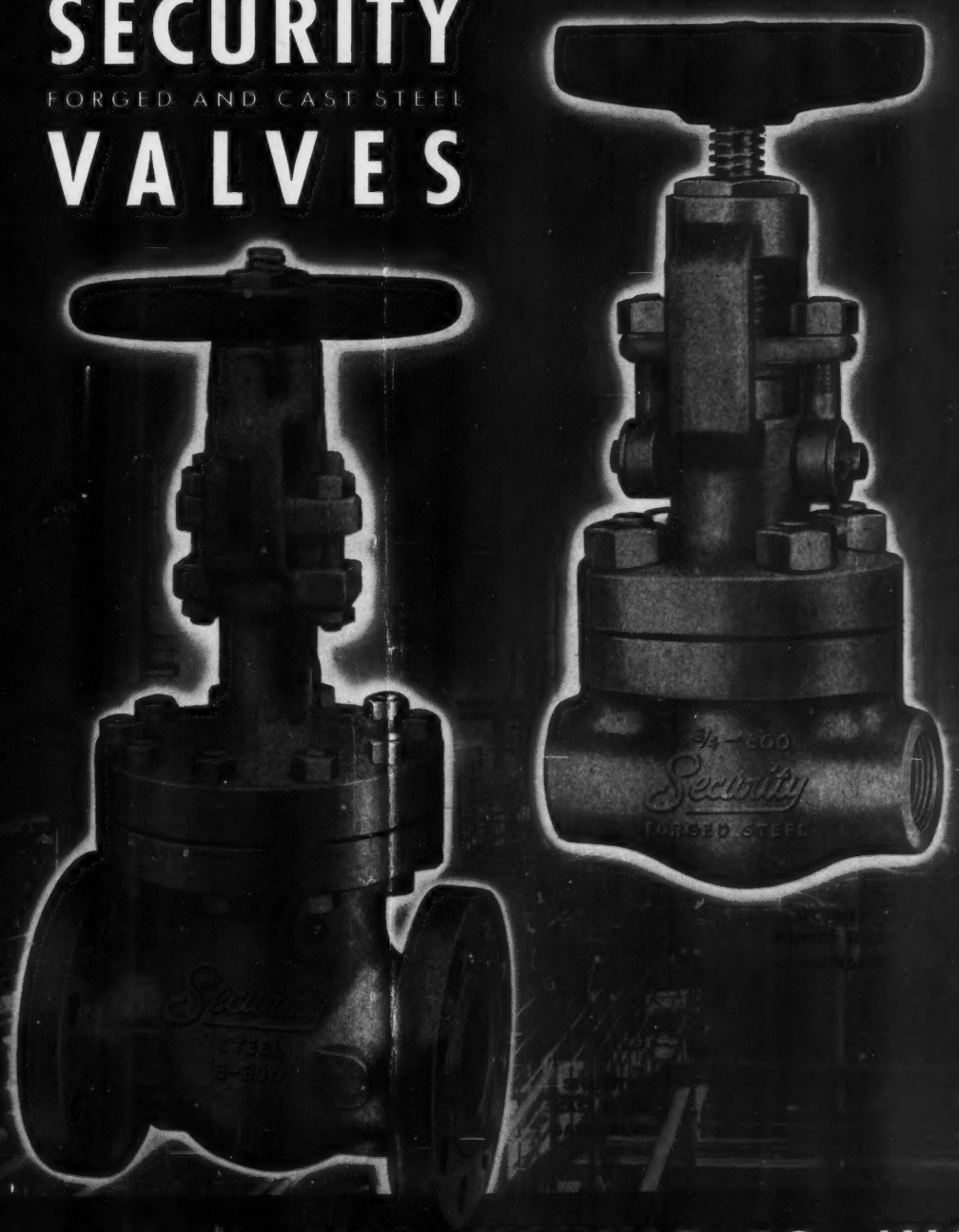

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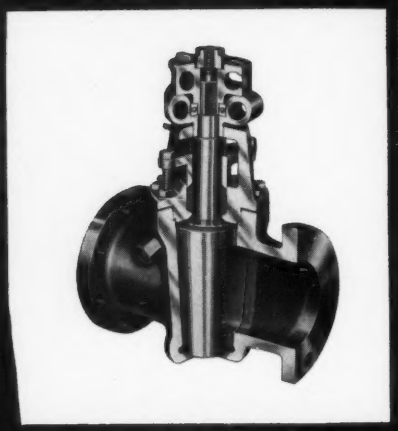

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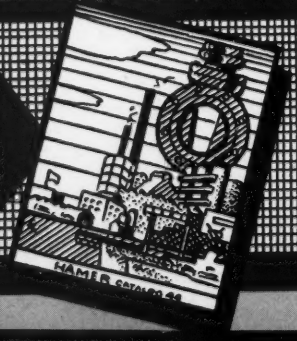

CALIFORNIA
OIL WORLD
and Petroleum Industry

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The West Coast's 100-Octane Program

Considerable space in this issue of California Oil World is devoted to the West Coast 100-octane construction program now being rushed to completion. Our air forces will depend very largely on the aviation fuel from these aviation gasoline plants in the growing operations in the Pacific theatre.

The program has gone forward without publicity until recently when military censorship restrictions were relaxed. The public, and to some extent the industry itself is only now becoming conscious of the tremendous undertaking which the program represents, the hurdles that have been surmounted, and the vital part the super fuel from these plants is to play in the winning of the war.

It is a very impressive story and one of which the oil industry may well be proud. The total investment in California will probably aggregate well over $150,000,000, largely industry money.

In the work yet to be done to complete the West Coast program the handicaps encountered from the beginning, principally shortages of materials and manpower, still remain, but good progress is being made in alleviating these problems, due no small measure to Army and Navy cooperation and to the assistance of the construction and materials divisions of the Petroleum Administration for War. The program should be completed about mid-year or shortly thereafter.

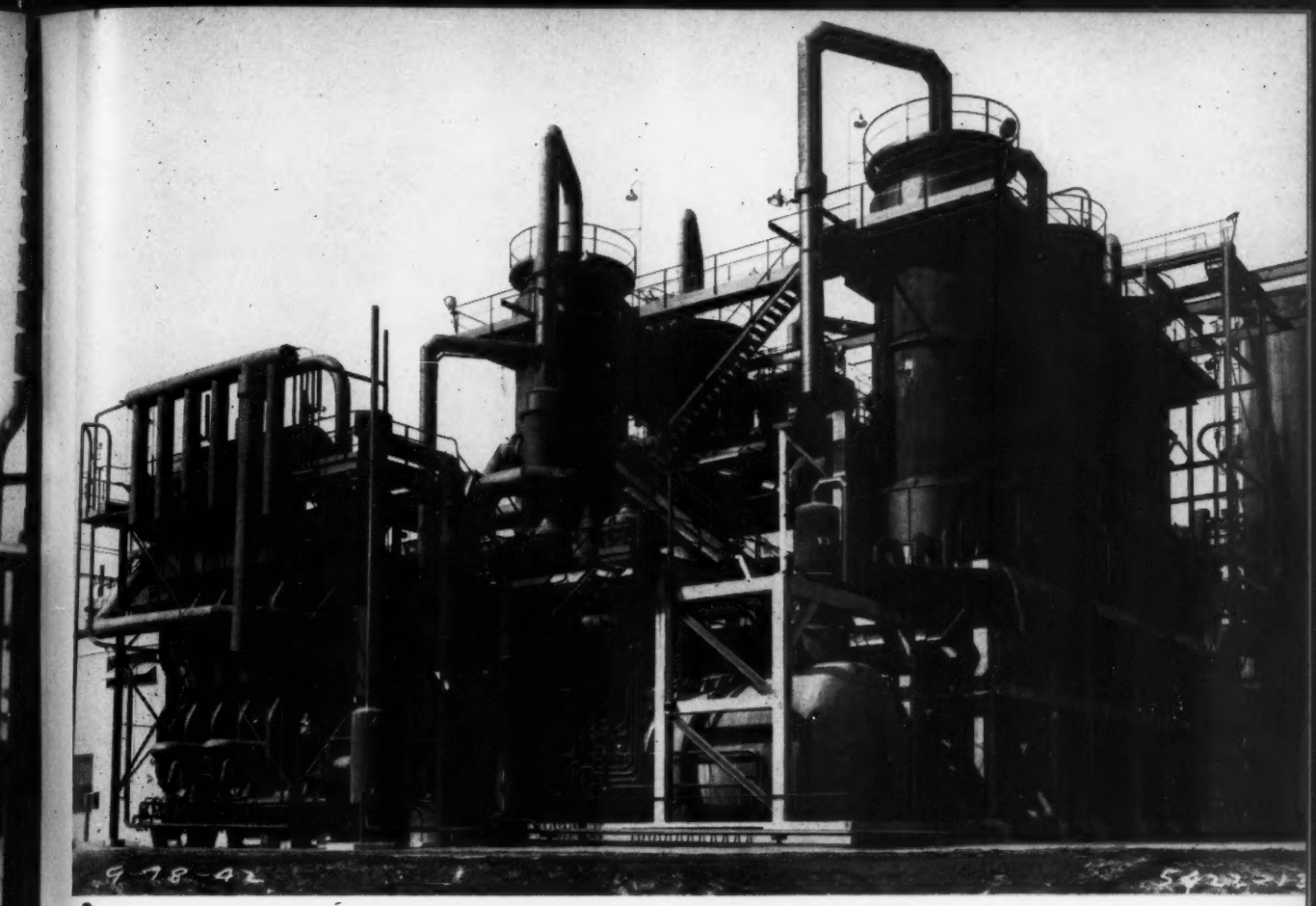
There has been considerable discussion and not a little concern over the effect of the 100-octane gasoline program on motor gasoline after the war. There is a feeling in some quarters that the post-war era will see a market glutted with aviation gasoline against which the refiner without aviation gasoline facilities will be unable to compete; that after the war there will be an octane race of hitherto unknown proportions which will cost the industry a great deal of money and leave many refiners entirely out of the running.

The measured judgment of those within the industry best qualified to discuss this subject is, however, reassuring.

It must be borne in mind, these commentators point out, that 100-octane aviation gasoline is now being made to the maximum capacity of the industry without regard to the economics of operating cost, crude utilization or transportation. Peace time requirements of this super fuel will be but a fraction of present production and the supply will come only from those who on the basis of sound economics can make the fuel. A substantial portion of the emergency aviation gasoline manufacturing facilities will be returned to the manufacture of motor gasoline under conditions chosen for economy rather than maximum octane number.

Motor cars of the immediate post-war period will have no radical changes from the 1942 models and motor design will undergo no important change, according to expert opinion in Detroit. Design changes will be evolutionary rather than revolutionary. We may, therefore, expect that the average octane number level of motor gasoline may increase as much as three units and that the majority of marketers will be able to offer house brands around 80 octane and premium products of about 85 octane. Higher values than these would result in extravagances in crude usage.

The swing back to peace time operation will not be without its problems, but the refiners are more concerned at the moment with giving the armed forces what they want, where they want it, and on time. The industry on the West Coast has a tremendous job to do in fueling the Pacific war machine. The 100-octane plants are being brought on production in the nick of time.



Standard of California's Houdry catalytic cracking plant which began turning out 100-octane gasoline in September, 1942. The plant was originally intended for manufacture of other types of gasoline as well, but was altered during construction to meet increased demand for 100-octane gasoline. At the left is the waste heat recovery steam boiler with the salt storage drum, center.

100-Octane Program Ranks as One of Industry's Outstanding War Jobs

Completion of the California oil industry's great aviation gasoline construction program is only a few months away. By mid-year, most of the plants in this program will be turning out 100-octane gasoline for our flyers in the Pacific. Five have been finished in recent weeks. Construction on seven others is being rushed, with the cooperation of the PAW, the Army and the Navy.

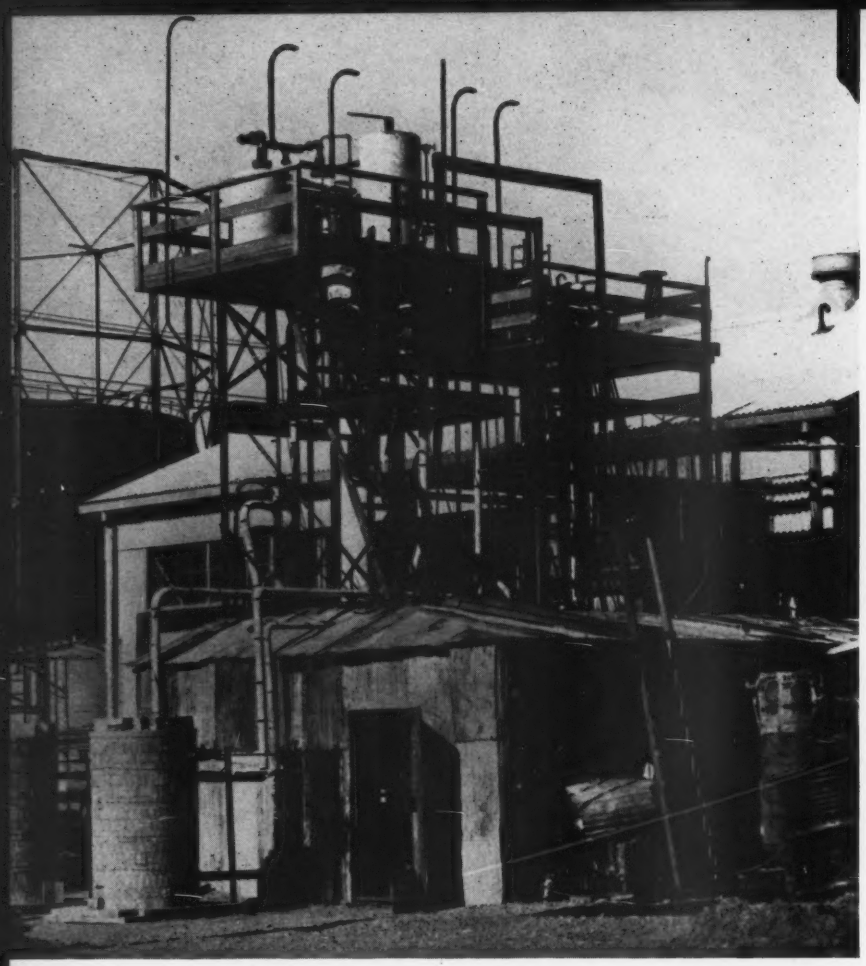
Left: Governor Warren of California chats with John S. Ritchie, maintenance foreman, high up on the "cat cracker" during Shell's dedication ceremonies at Dominguez refinery. Later, the Governor told Shell workers: "You have not received the public recognition given workers in plane plants and shipyards, but you are doing just as vital war work . . . . I share the feeling that you men are soldiers."

Cost of this amazing program in California alone is variously estimated at $150,000,000 to $200,000,000. An Army general, commending on the job done by the industry's refinery experts said: "It is almost unbelievable. They have virtually squeezed it out of a hat."

Companies in the West Coast program are Standard of California, Shell, Richfield, General Petroleum, Texas Co., Union Oil, Tide Water Associated, Wilshire, and Mohawk.

One-hundred-octane will be produced by these refiners and by other refiners throughout the country in amounts that would have seemed fantastic two and a half years ago. It is, in fact, only nine years ago that 100 octane gasoline was first made in commercial quantities—by Shell, in the small California plant shown on the following page.

The 100-octane construction program will rank as one of the outstanding accomplishments of the war. The program has had little publicity, for military reasons, and this has served to aggravate materials and manpower problems. Recently, however, restrictions have been relaxed by the War Department to the point where plants can be fairly well publicized. An important result is that workers are becoming aware of the importance of the war jobs they are performing. There is a consequent improvement in worker efficiency and labor turnover.



Shell Oil Co. was first to make 100-octane gasoline in commercial quantities in 1935. Here is the plant in which it was made. In contrast, across the page, is Shell's new catalytic cracking plant, which has just been completed at its Dominguez refinery.

Some of the California installations in this great 100-octane program are described and illustrated on this and ensuing pages of this issue.

Governor Dedicates Shell Plant

Dedicated by Governor Earl Warren of California to the "men of our flying forces," in the presence of distinguished army and navy officers, Shell's new catalytic cracking plant in Southern California today is pouring out material for 100-octane aviation gasoline to keep Japan on the run.

It is the first unit of its kind started after Pearl Harbor to be completed in the entire United States. Shell's new fluid catalytic cracking plant is the heart of a $20,000,000 installation at Dominguez refinery for the manufacture of 100-octane gasoline.

The installation covers 30 acres of ground and includes plants for alkylation, butane isomerization, feed preparation, product fractionation, and high pressure hydrogenation.

The "cat cracker," recently completed, is 240 feet high and required 18,000 tons of steel. More than 100 miles of pipe were used. It was 17 months in building and 1000 men were employed on the work. The plant requires a staff of 200 men to operate it.

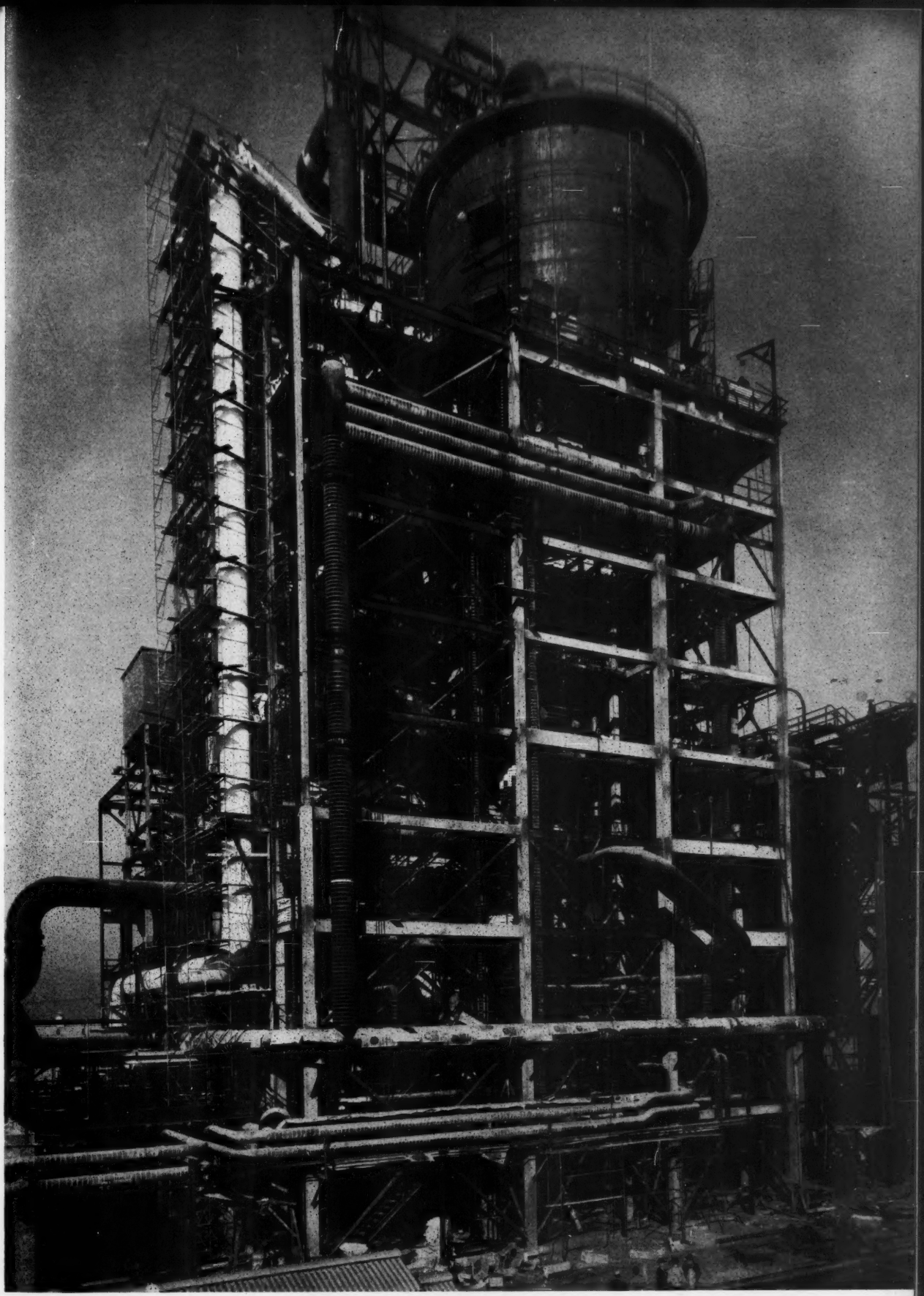
Dedication of the plant took place at a colorful ceremony which attracted attention because of its significance to the war program. A silver plaque commemorating the occasion was presented to the employees by Governor Warren. Major General Ralph H. Cousins, commanding the Western Flying Training Command, and Rear Admiral J. R. Defrees, inspector of naval material, headed the delegation of officers who attended. The Petroleum Administration for War was represented by Herbert R. Gallagher, regional director for PAW, and M. P. Youker, director of refining.

Employees took a leading part in entertaining the guests at the refinery and in the dedication ceremonies. The Labor-Management Committee received the Governor and other visitors at the "cat-cracker" control room. Ralph E. Corbett, Dubbs plant operator and co-chairman of the Labor-Management Committee, introduced the Governor to the hundreds gathered to hear him speak. George C. Montgomery, manager of the catalytic cracking department, received the silver plaque from the Governor.

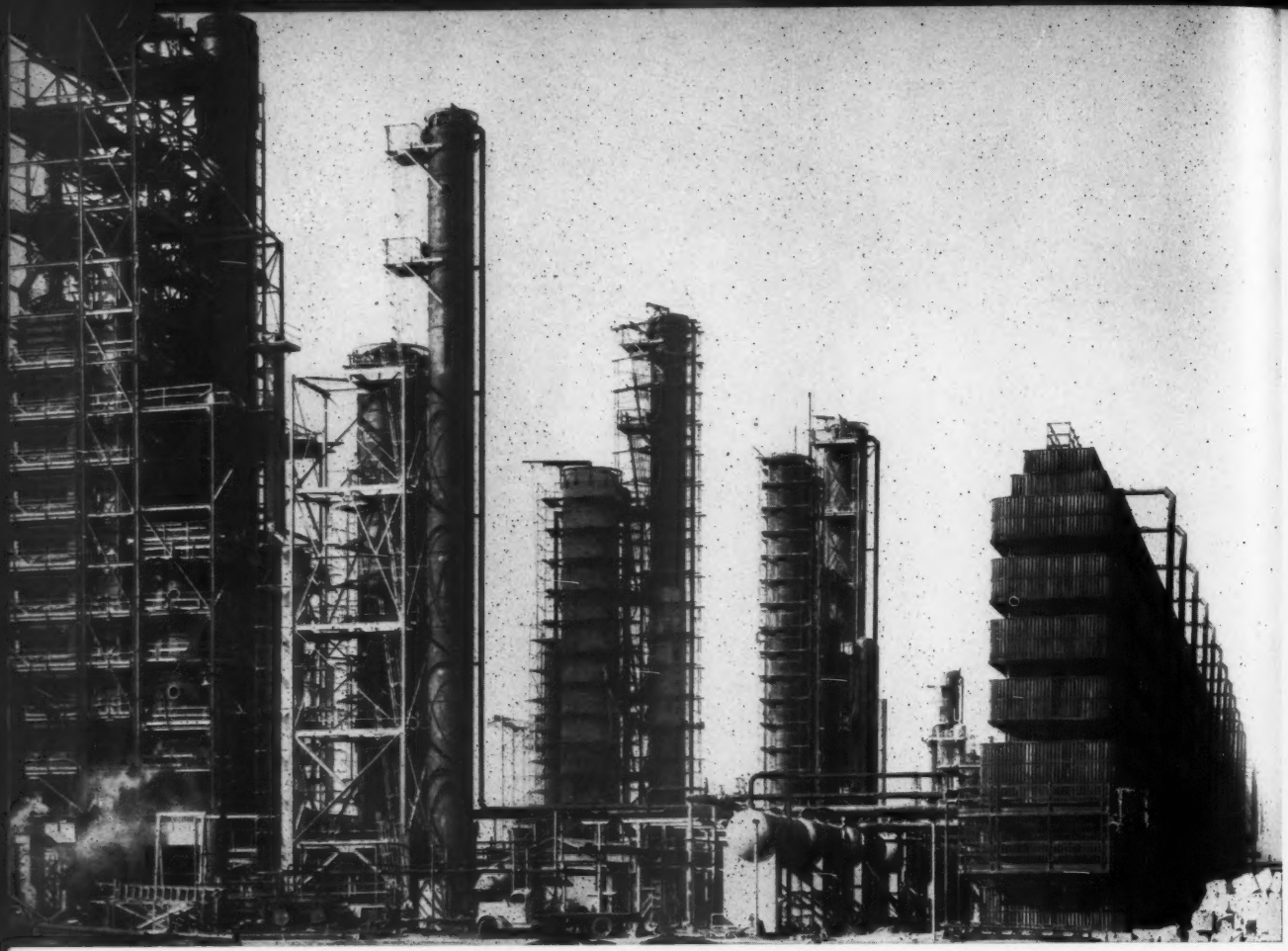
G. P. Completes TCC Unit

General Petroleum's new 100-octane aviation gasoline plant has just been completed. It utilizes the new

Governor Warren pauses for a view skyward at Shell's catalytic cracker. Left to right: A. H. Calderwood, refinery manager; Governor Warren, S. Belither, executive vice-president; F. S. Clulow, vice-president; and Maj. Gen. Ralph H. Cousins of the Army Air Forces.



An imposing close-up of Shell's "cat" cracker, the heart of a $20,000,000 100-octane installation.



General Petroleum's new 100-octane aviation gasoline plant, utilizing the Thermofor catalytic cracking process, has just been completed at the company's Torrance, Calif., refinery at a cost of $12,000,000. General view of the new installation is shown here.

Thermofor catalytic cracking process which was developed by Socony-Vacuum engineers and has been made available to the government, with licenses granted for building 28 such plants throughout the country.

Approximately 1,000 construction workers on the 100-octane refining units of General Petroleum Corporation were guests of honor January 15, when the new TCC plant was formally dedicated by officials of the company and high-ranking army and navy officers.

"Take pride in the work that you are doing," asserted Major General Ralph P. Cousins, AAF, one of the feature speakers, "for you must know that you . . . the workers on this plant . . . form a link in a chain of vitally important operations which must not be broken or disturbed."

With similar statements, the workers were addressed by Admiral Elliott Buckmaster, Commandant of the U. S. Naval Air Center at San Diego; Major Knox Manning, AAF, who was with the first troops to enter Bizerte and landing at Salerno; Captain Eugene Wallace, AAF, the hero who was shot down by Japs off New Britain and escaped after ten harrowing months in the jungles; George F. Prussing, director of construction for the Fifth District, Petroleum Administration for War; C. J. Haggerty, secretary of the State Federation of Labor, A.F. of L.; S. J. Dickey, president of General Petroleum Corporation; and R. C. Wheeler, vice-president in charge of this company's manufacturing operations.

President S. J. Dickey and Vice-President R. C. Wheeler, of General Petroleum Corp., were photographed at company's 100-octane dedication ceremonies with Rear Adm. Elliott Buckmaster, who told workers: "You form a link in a chain of vitally important operations."

The new unit at Torrance comprises a gas plant to process all refinery gas for recovery of iso-butane and butenes. These hydrocarbons are reacted in a hydro-fluoric acid alkylation unit. In addition, Thermofor continuous catalytic cracking units complete the major processing facilities.

A total cost of twelve million dollars is estimated. Lummus Co. were the contractors.

The gas plant and alkylation operations are largely conventional, except that the alkylation plant is one of the first on the coast to utilize hydro-fluoric acid. At the present time two Thermofor catalytic cracking units, each of normal 10,000 barrel per day capacity for gas-oil charge are involved. Later an exact duplicate of these catalytic units will be added, probably about June, 1944.

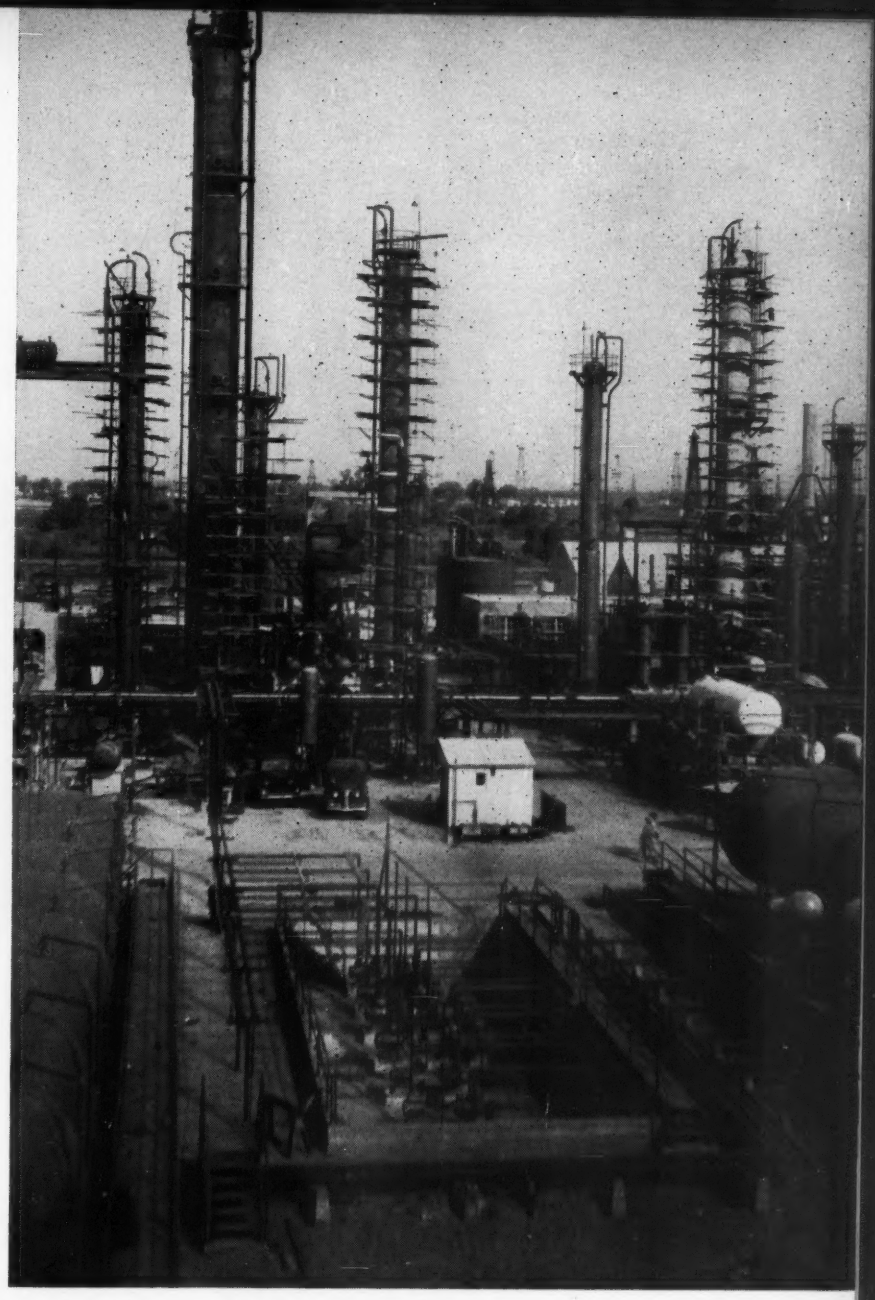
In operation gas-oil will be processed in two of the units with retreatment of the first-pass gasoline in the remaining two. This type of processing is used to insure both maximum quality and quantity of catalytic base stock in order to produce the ultimate of finished 100-octane aviation blend.

The volume of alkylate usually is the limiting factor in blending 100-octane gasoline specification. General Petroleum engineers state that the large volume of high-quality base stock which this plant can produce will effect a much more economic use of aviation alkylate than in the normal case where straight-run base stock is used.

Careful pre-planning in General's plant as to type of process and operations was carried out to insure that the quality requirements as frequently revised upwards could be met.

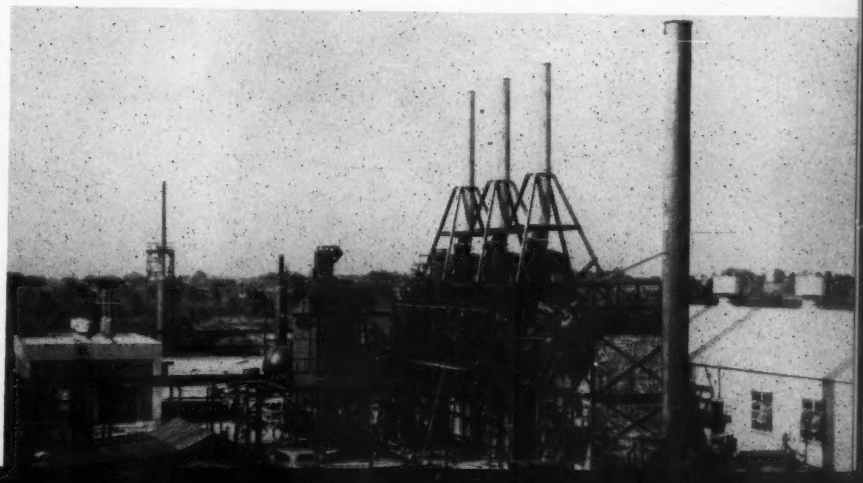
Union Spending $40,000,000

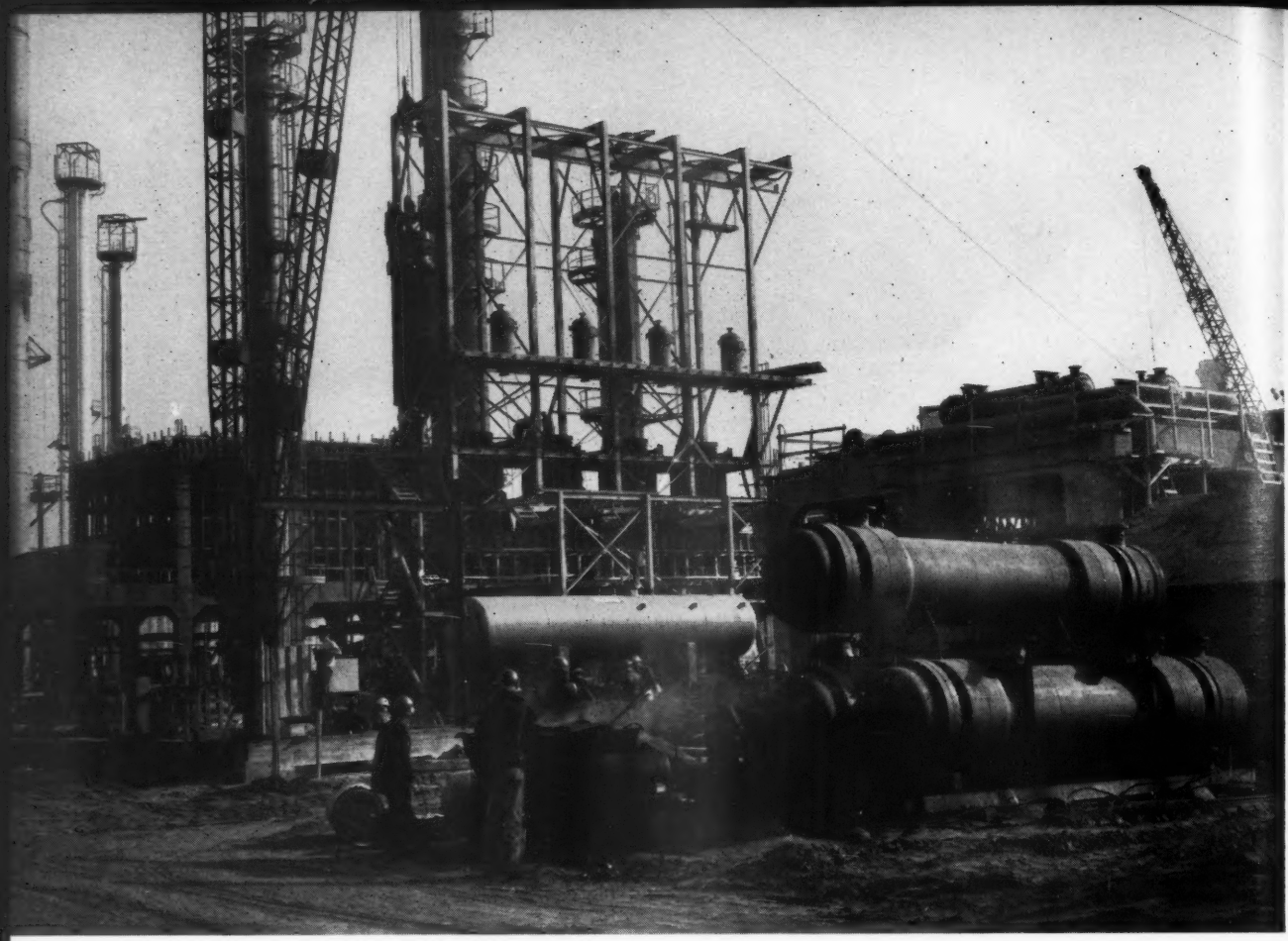
Covering thirty acres at Wilmington, Calif., and representing an investment of $40,000,000, Union Oil Co.'s new refinery was recently placed in operation. The new units multiply by six or seven times Union's output of 100 octane. Now that the new facilities are completed, the average yield of gasoline from crude oil processed in Union's refineries has been increased from 22% to 44%. Much of that additional gaso-



Mohawk Petroleum Corp. has just completed this 100-octane plant at Bakersfield. Plant comprises reformers, gas concentration, isopentane splitter, isomerization and alky units.

Below: Steam plant in Mohawk Pete's Bakersfield refinery. New facilities for the production of 100-octane gasoline were installed at a cost of approximately $4,000,000.00.





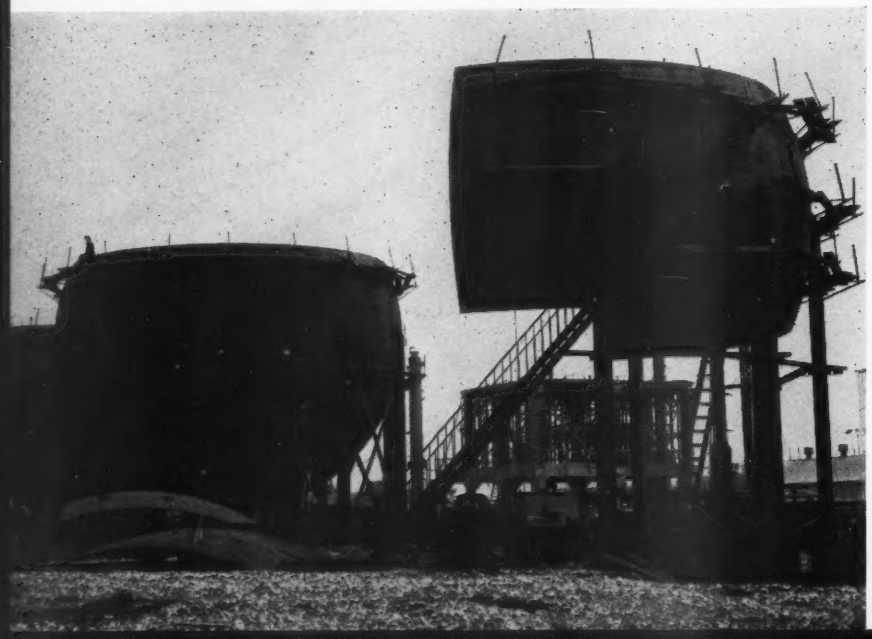
Texas Co. expects to complete its 100-octane plant at the Wilmington, Calif., refinery by mid-year. Under construction above is the No. 2 alkylation unit in the new plant. A cracking unit and additional boiler capacity are also included in this company's program.

line will go to the armed forces, but some of it will find its way into the service station for retail sale.

The most impressive section of the new construction is the combination distillation and cracking unit. It is unique, not only because of its size, but because it is virtually a refinery within a refinery.

From the time crude enters its heaters, until the last fractionating tower has made its final separation, each barrel has been pumped from one place to another to equal a total circulation of twenty barrels. Each has yielded, among other things, diesel, fuel, and stove oils, toluene stock, domestic gasoline, and aviation feed stock.

How a spherical tank gets that way. Picture shows alkylation charge and rundown tank under construction in Texas Co.'s new plant. These are 12,000-barrel butylene spheres.



Tank storage of the different compounds between processes has been eliminated by a system of interconnecting pipelines—the flow of oil is continuous from beginning to end.

All major streams are controlled from one point. Smaller, but important units, are "fed" by the combination unit. They carry ahead not only the production of certain aviation gasoline components, but form others of high quality by the conversion of normally gaseous stocks.

The catalytic cracking unit dwarfs the other structures in the refinery area. Twenty stories high, it required a special building permit for its construction. Its equipment in-

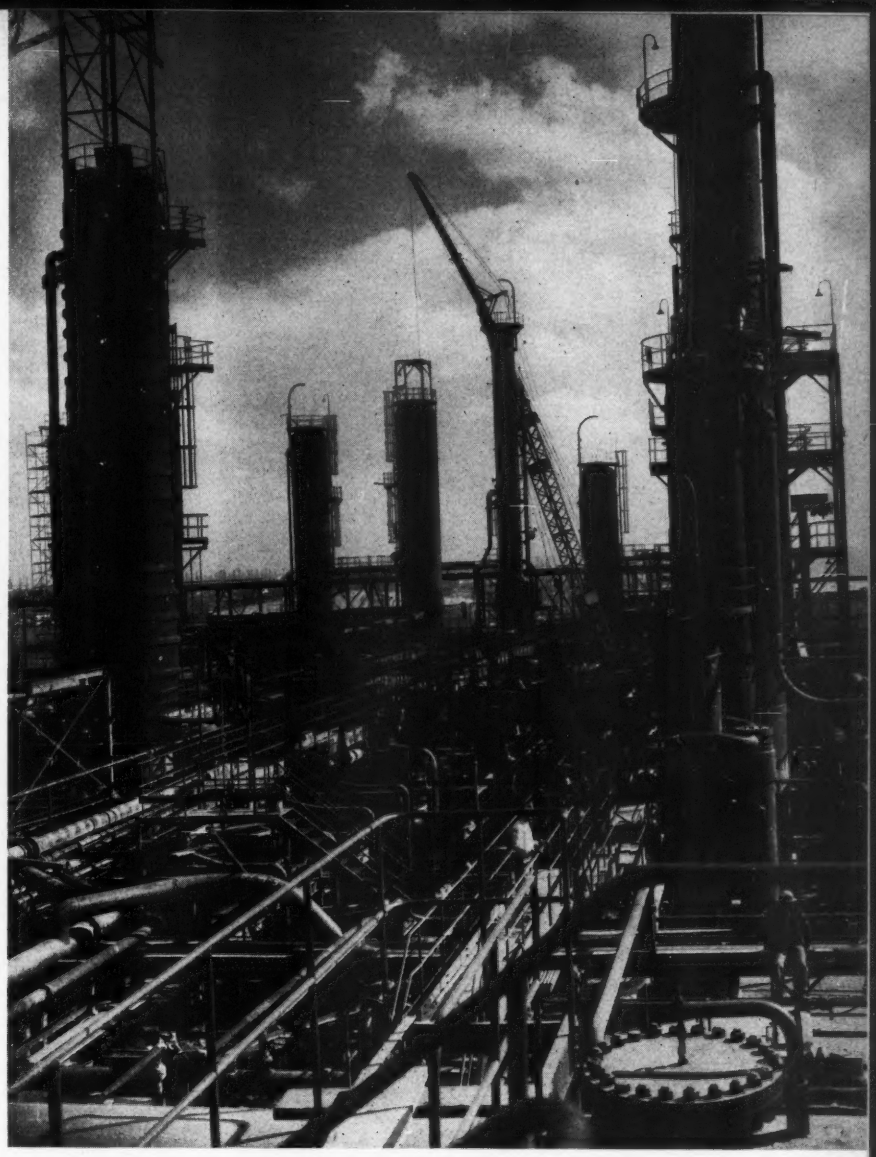
cludes an elevator to enable operators to reach its various levels, and a telephone communication system. If you've wondered why automobiles are no longer built, here's one reason—35,000 of them could be fabricated from the weight of steel used in the structures. In operation, the units will consume enough electrical energy to take care of 100,000 homes, enough heat to warm a city of a million people.

Standard Has Big Program

Since Pearl Harbor, Standard of California has trebled its output of 100-octane gasoline and before the year is out, Standard expects to step up by one-third its present 100-octane production.

Prior to 1940, Standard had invested $3,755,000 in 100-octane facilities at Richmond and El Segundo. Since, $10,072,000 has gone into developing and expanding these projects. Now under construction at the company's Richmond refinery is a separate $13,500,000 Defense Plant Corporation 100-octane plant. And, in addition, responding to military request, Standard temporarily has converted its $10,000,000 toluene plant at Richmond to aviation gasoline production.

Included in the original $13,827,000 program are a hydrogenation



Right: Union's new units will multiply its output of 100-octane six or seven times.

Newspaper and radio commentators toured Union's refinery, had lunch with company officials. Standing: A. C. Stewart and A. C. Rubel, vice-presidents; Major C. B. Robertson, army censor; Basil Hopper, manager of manufacturing; H. W. Sanders, treasurer. Seated: Fleetwood Lawton, radio commentator; Reese H. Taylor, president, and William L. Stewart, Jr., executive vice-president.

Standard of California's toluene plant which has been converted almost overnight to the manufacture of 100-octane. L. to r., compressor house, catalytic section, fractionating columns of the rerun section, control house, distillation section and the furnaces.

plant, two alkylation plants, two isomerization plants and a $5,384,000 Houdry catalytic cracking unit.

The Houdry unit project was started before Pearl Harbor and originally was intended for production of other types of gasoline as well as 100-octane. During construction, the plant was altered to meet ever-mounting demands for aviation fuel.

Both of these alkylation plants were completed before the United States went into the war and additions since have been made to increase the capacity of the Richmond unit 50 per cent and to treble capacity at the El Segundo plant. The two isomerization plants went into production since Pearl Harbor.

The toluene plant changeover from materials for explosives to gasoline production was made almost overnight. The quick shift was possible because Standard engineers had designed the original facilities to manufacture toluene by a process similar to that producing 100-octane.

The toluene process and the catalyst it utilizes were developed by Standard scientists. The catalyst, made at the refinery in a unit especially constructed for the purpose, likewise is being used to manufacture high test gasoline in the converted toluene plant.

As in the toluene process, the charging stock is heated and vaporized in tubular, fired furnaces where oils and gases are raised under high pressure to approximately 1,000 degrees. The resulting gases pass through reactor chambers filled with the catalyst. Here the aviation gasoline is formed. The product then goes through a series of four distillation units for separation before final blending.

$13,500,000 DPC Project

Towering elevators used in the catalyst equipment in the new $13,500,000 DPC project will dominate the Richmond skyline.

Because of the number of individual units involved, the planning and designing represented a major engineering job. Some of the utilities equipment would fill the needs of a city. A pipe line two and a half to three feet in diameter will carry as much as 46,000,000 gallons of water daily for cooling and condensing vaporized products. More than 200 men and women will be employed. There will be two Thermofor catalytic cracking units through which several thousand barrels of gas-oil will be passed daily, emerging as high octane blending stock and by-products in the form of iso-butane and butenes.

These will be fed to a $3,000,000 alkylation plant, which is part of the facilities, to produce an alkylate gasoline necessary for the 100-octane product. Operating simultaneously will be an isomerization plant, developed by Standard of California research scientists, which will convert normal butane into iso-butane for the alkylation process. Base stocks thus produced will be blend-

ed with straight run gasoline fractions to produce finished 100-octane gasoline.

One hundred octane plants, under construction by The Texas Co. at Wilmington, Calif., Tide Water Associated Oil Co., at Avon, and Richfield Oil Corp. at Watson, are not scheduled for completion until some time in July or August of this year.

The Texas Company installation will include cracking unit, important addition to the alkylation capacity and added boiler capacity. Cost of the new construction is estimated conservatively at $16,000,000. The work is being done by three contractors: Foster-Wheeler Corp., M. W. Kellogg Co., and Bechtel-McCone-Parsons Corp.

Tide Water's existing 100-octane facilities and projects under way will represent an investment of about $20,000,000. A fluid "cat" cracker and a pentane isomerization unit are under way at the Avon refinery. Additions to existing 100-octane facilities at the refinery also include a series of superfractionation columns for natural gasoline and gasoline streams from the crude distillation units; a solvent refining plant; butane isomerization plant; and alkylation facilities, utilizing sulphuric acid in the alkylation of butylenes, amylenes and propylenes.

Richfield has under construction at its Watson refinery a Thermofor catalytic cracking unit, and in addition, increased alkylation capacity and new fractionating equipment and auxiliary facilities are being built by the Lummus Co., contractors, at a cost of about $14,500,000.

Independents in Program, Too

Wilshire Oil Co. of Norwalk, and Mohawk Petroleum Corp. of Bakersfield are two of the so-called independent refiners in California who are participating in the 100-octane program. Wilshire's plant is the subject of a separate article in this issue.

The production of 100-octane aviation gasoline from Mohawk's new facilities depends on the preparation of a selected feed stock from which the blending component, or alkylate, is made, and the precise fractionation of straight run gasoline to produce the remaining components.

In the new plant there are four more or less interconnected units which perform the above operations. The reforming unit makes the butylene and amylene necessary in the alkylation reaction. The gas concentration unit refines the crude butylenes and amylenes to rid them of undesirable light and heavy components. The isomerization unit makes isobutane, also necessary in the alkylation reaction. The alkylation unit combines the isobutane, butylene and amylene to produce alkylate. The isopentane splitter separates casinghead gasoline into a residual straight run gasoline, normal butane and isopentane, the latter being a necessary component of 100-octane aviation gasoline.

How Mohawk Operates

Straight run naphtha from Mohawk's plant is charged to the reforming unit where it is cracked under pressure and high temperature. The products from this cracking are a reformed gasoline of good octane number and light hydrocarbons. The gasoline is separated from the light hydrocarbons in the depentanizing column of the gas concentration unit, and returns to the old refinery for use in motor fuel. The overhead from the depentanizing column contains the butylene and amylene necessary for alkylation and is charged to the depropanizer of the gas concentration system for removal of propane and lighter gases. These light gases are returned to the old plant for fuel and polymerization unit charge.

In addition to the material from the reformer, the gas concentration unit is also charged with light hydrocarbons from the cracking units at the old refinery for removal of butylene and amylene. The concentrated B-B feed from the bottom of the depropanizer goes through caustic scrubbing equipment to remove sulfur and then into horizontal closed vessels for storage as alkylation plant feed.

From storage, the B-B is charged through dryers to a pair of Stratco contactors, where it is intimately mixed with isobutane and hydrofluoric acid to bring about the alkylation reaction. The contactor effluent goes to a settler, from which the acid is continuously recycled to the contactors. The hydrocarbon in the settler, containing alkylate, butanes, pentanes, propane and a small amount of dissolved acid and organic fluorides is next depropanized to effect the removal of propane and dissolved acid. The dissolved acid is then stripped from the propane in the acid stripper and returned to the settler.

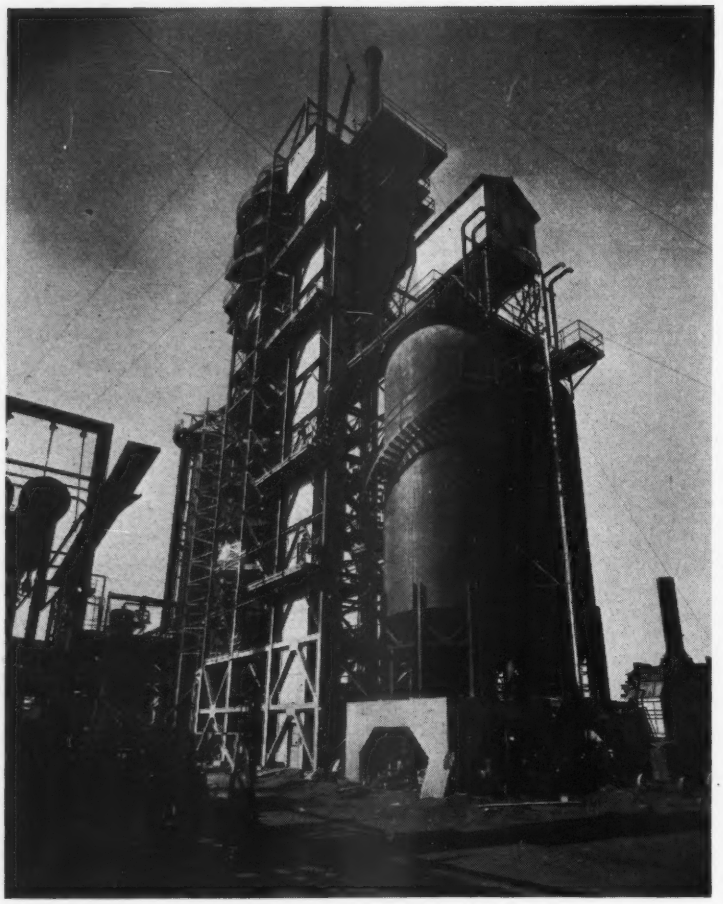
The depropanized hydrocarbon stream is charged to towers packed with bauxite, where the organic fluorides are absorbed.

Successive Fractionations

The remainder of the operation consists of successive fractionations to remove isobutane, butane, pentanes, and finally to separate the small fraction of heavy alkylate from the aviation alkylate. Another bauxite treat is given between the deisobutanizer and the debutanizer.

The deisobutanizer overhead is recycled to the contactors, to maintain an isobutane-olefin ratio of five to one or better. The debutanizer overhead is stored or charged to the isomerization unit, to produce isobutane. The isomerization effluent consisting almost entirely of butane and isobutane is combined with the casinghead butanes from the pentane splitter and charged through dryers to the deisobutanizer. The depentanizer overhead is charged to the pentane splitter for separation into isopentane and normal pentane for reasons given above. Aviation alkylate is taken overhead in the final fractionation, and the heavy alkylate bottom is used as flush in pumps and controls, excess being stored or used as quench on the reformer.

The hydrofluoric acid used to catalyst the alkylation reaction becomes less effective as it is diluted with water and heavy tars resulting from side reactions. To keep the acid at proper strength, a small stream is charged to the acid regeneration system and given two fractionations. In the first, the heavy tars are removed as a bottoms product and in the second, pure acid is taken overhead and returned to the settler while an acid-water mixture of about 40% strength, the constant boiling mixture for this system is drawn from the bottom into a neutralizing pit.



U.O.P. fluid catalytic cracker at Wilshire's Norwalk refinery. Catalyst hoppers are shown in the right foreground.

Cracking of the feed stock is carried out at low pressures and relatively high temperatures. — Meriman photo.

Wilshire Plant Producing 100-Octane

On December 7, 1943, just two years after Pearl Harbor, the Wilshire Oil Co., Inc., celebrated the starting of its 100 octane aviation gasoline refinery at Norwalk, California.

The completion of this refinery indicates the growth of Wilshire since June 15, 1936, at which time officials of the Wilshire Oil Company, Inc., headed by G. L. Machris, president and chairman of the board of directors, opened the valve that placed in operation their Dubbs Process cracking plant at Norwalk.

Hardly had this plant started when it became evident that a polymerization unit was necessary to utilize the refinery gases and thereby manufacture a higher octane gasoline. The U. O. P. catalytic-type polymerization plant was selected as the most economical and practical. This unit was completed in June, 1937, producing polymer which enriched the regular gasoline and made available a motor fuel with higher natural anti-knock qualities than ordinary gasoline. In this unit refinery gases from the cracking stills were brought into intimate contact with a dry phosphoric acid catalyst under a predetermined temperature and pressure. This treatment changed the structure of the gaseous hydrocarbons resulting in the production of a liquid having all the properties of a motor fuel of exceedingly high octane. This high anti-knock polymer was blended with the naturally high octane cracked gasoline from the Dubbs unit resulting in a blend marketed by the company as Polly Gas.

George L. Machris, president, has guided Wilshire's progress into the big leagues.

The public acceptance of this material was so great that following closely in the wake of the operation of this unit the management real-

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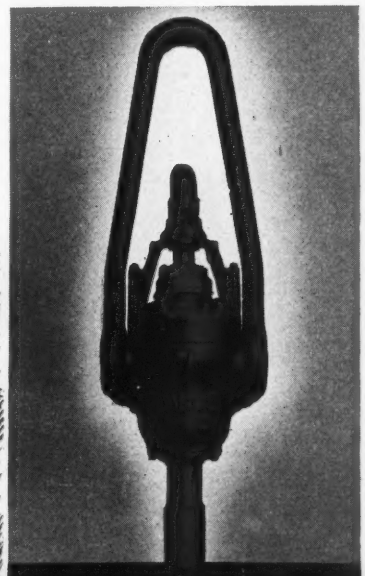

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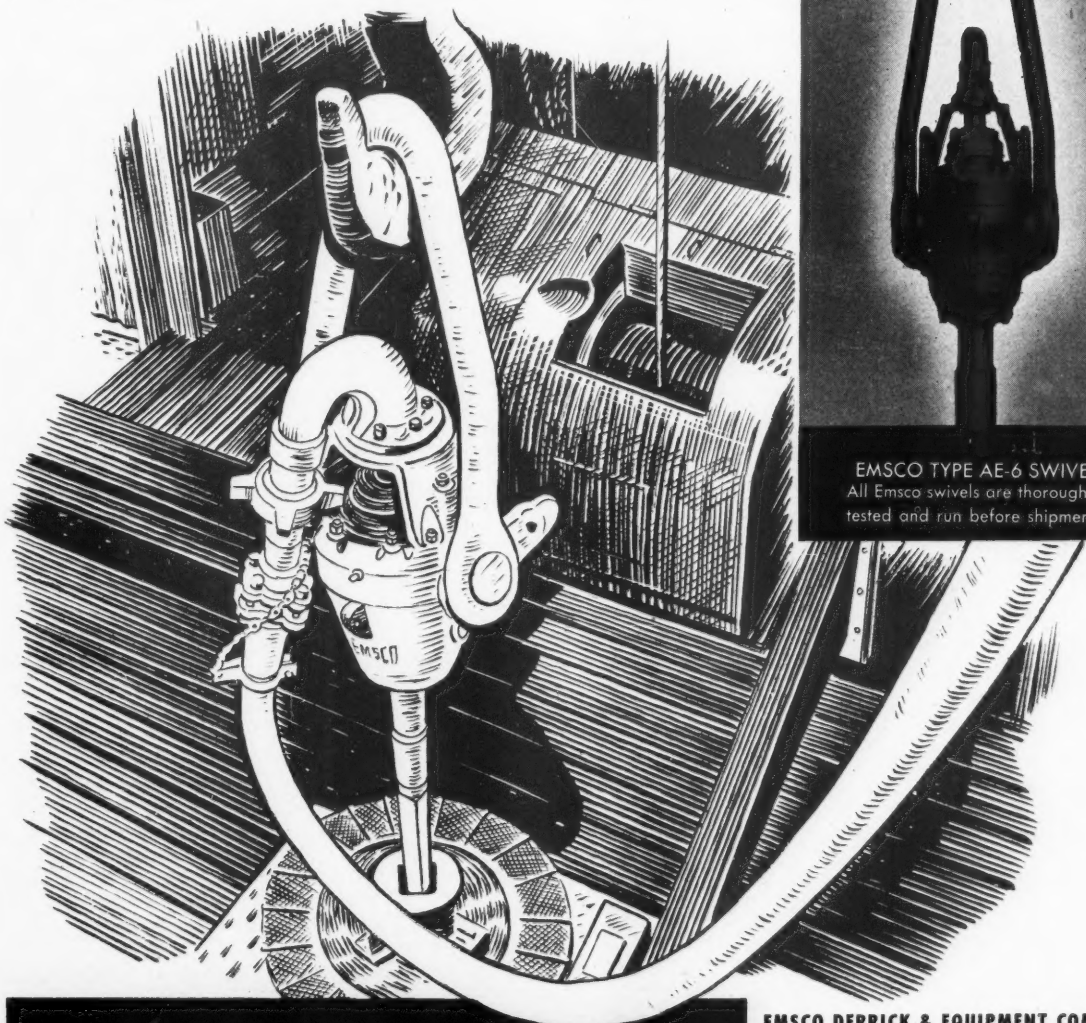

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ized that in order to round out the refinery operations and increase the yield of higher octane gasoline, it would be necessary to install a reforming unit. Consequently in 1938 a reformer was placed in operation. This unit, through the medium of heat and pressure, changed low octane gasoline into high octane gasoline by reforming the molecular structure, resulting in a greater quantity of natural anti-knock gasoline and desirable gases to be processed in the polymerization plant.

Improvements to the refinery in general followed: bottlenecks were reduced, capacities increased, additional gas compressors installed, smoother, safer and more efficient operation became the watchword.

In order to serve those who were accustomed to using Ethyl gasoline, a plant for blending tetraethyl lead into gasoline was installed in March, 1940.

Early in 1941, M. A. Machris, executive vice president, together with his technical and engineering staff, realized that the demand for 100 octane gasoline and its components for use by the U. S. armed forces would soon become a major problem of the refining industry. This thought became an actuality upon the entry of the United States into World War No. 2 and at this time the Wilshire technical staff headed by F. B. Behrens, assistant refinery supt., and O. E. Liddell, chief engineer, collaborating with the Universal Oil Products Co. of Chicago, proceeded with preparations as to design and capacities for a refinery to meet this problem.

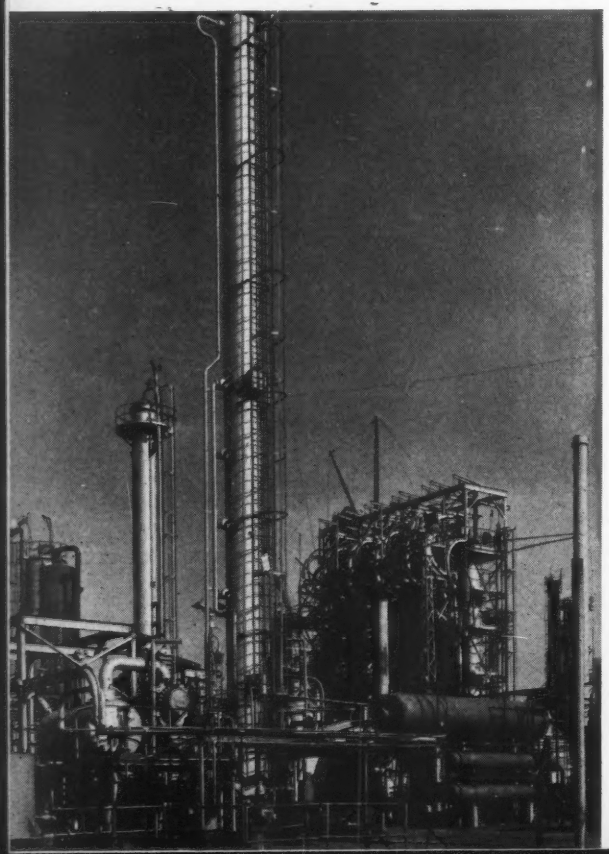
Contacts were made with the proper governmental authorities by R. F. Forch, chief counsel for Wilshire, and on April 29, 1942, a contract was entered into with the Defense Plant Corporation for the erection of an 100 octane refinery to be placed on property adjoining and in the present cracking plant area at Norwalk, California, and to operate in conjunction with it.

First to Produce Cumene

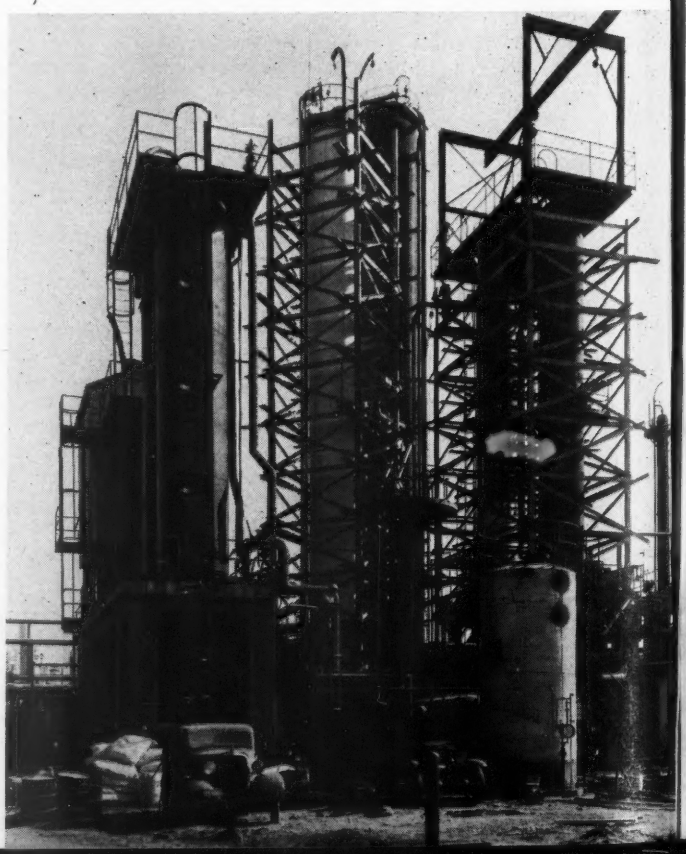
Immediately following this first hurdle the petroleum industry was called upon to furnish a component of 100 octane gasoline known as cumene. This material was needed by our Air Forces in large quantities and with all possible speed. Much credit is given to F. B. Behrens and his staff and O. E. Liddell and his staff, for their foresight and ingenuity in anticipating this problem and for the speed and efficiency displayed in the conversion of the polymerization plant into a cumene plant. In June, 1942, just twenty-eight days after the "go" signal, the plant was on production, the first commercial producer of cumene on the West Coast. Operating techniques were developed to the point where maximum capacity was soon obtained. With the completion of the 100 octane unit, it was obvious that additional feed stock would be made available which would necessitate revamping this unit in order to triple the original production. This expansion has been completed, thereby making Wilshire one of the largest producers of cumene in the West.

The blueprints for one change were still on the drafting board when other alterations were made necessary by the increasing volumes of commodities needed for the war effort by our Armed Forces; namely, 91 octane gasoline, Navy fuel oil and products for the manufacture of synthetic rubber. These alterations in refinery equipment and changes in operating methods were effected with all possible speed by the refin-

U.O.P. catalytic poly plant was converted to a cumene unit.



Isomerization unit, reactors and fractionating equipment.



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The Fluor Air-Cooled Muffler reduces exhaust noises in three ways (1) through the exclusive concentric baffle design of the muffler itself (2) through the cushioning effect of the exhaust stream meeting an air stream at the ejector cone (3) a further cushioning provided by an air stream flowing the full length of the exhaust line.

- **THEY USE EXHAUST ENERGY TO VENTILATE**

Exhaust energy, normally wasted in other type mufflers, is utilized by Fluor Air-Cooled Mufflers to draw off and expel to the atmosphere fumes, stale air, and engine room heat. Cooler engine room and floor temperatures are obtained, and maximum ventilation is afforded.

- **THEY PROVIDE COOLER PIPES AND STACKS**

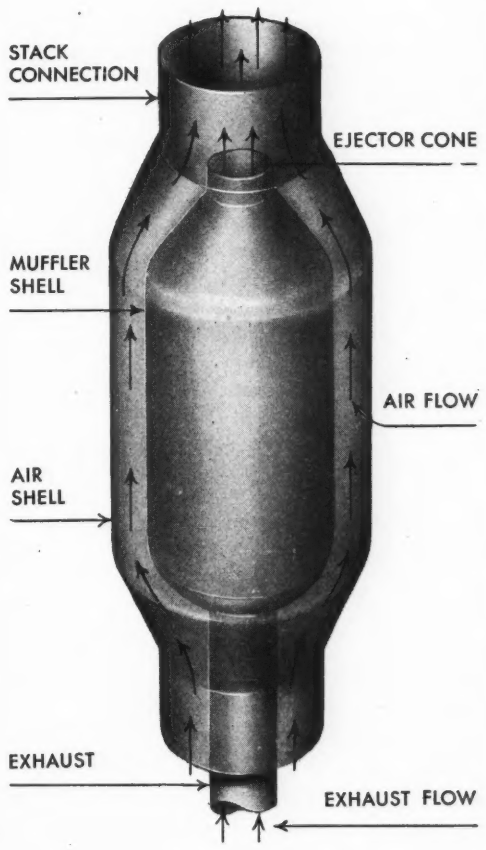
The induced flow of air throughout the entire length of the exhaust system eliminates the necessity for insulation, lowers stack temperatures, and reduces fire hazards to a minimum.

- **THEY ELIMINATE WATER COSTS AND CORROSION**

Because they use air instead of water as the exhaust cooling medium, Fluor Air-Cooled Mufflers eliminate water costs, corrosion of exhaust pipes, muffler, and nearby equipment. No expensive water line installations are required.

- **THEY GIVE CONTINUOUS, LONG-LIFE SERVICE**

Fluor Air-Cooled Mufflers present no maintenance problem. Their simple, yet rugged design, provides dependable, continuous operation, year in, year out. Units installed 15 years ago are giving efficient, trouble-free service today.



...A SIMPLE, EXCLUSIVE DESIGN

For its basic operating principle, the Fluor Air-Cooled Muffler employs a series of concentric baffles, together with a modified venturi jet discharge, whereby the hot exhaust gases induce a flow of air in the air jacket encasing the exhaust line and muffler. Fluor Air-Cooled Mufflers are cool, quiet, safe and economical.

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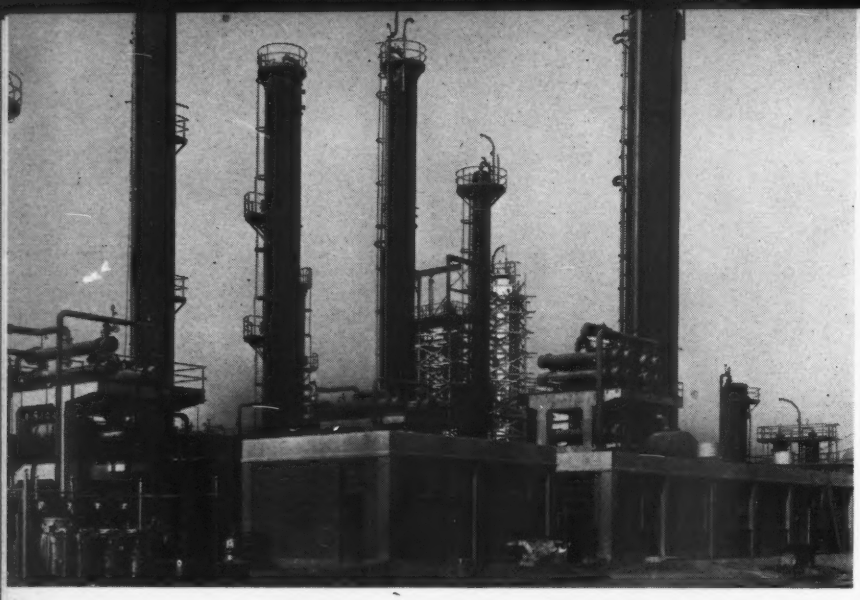


Alkylation and isomerization control house. Fractionating section in the background.

ery personnel headed by John Beddow, refinery superintendent.

During this period of revamping and conversion, the Defense Plant Corporation, the Universal Oil Products Company, the Wilshire Oil Company, Inc., and the general construction contractor, the Fluor Corporation, Ltd., were planning and constructing the 100 octane units. Accompanying illustrations show these units as they appear today.

Isomerization Unit

One of the plants necessary for aviation fuel manufacture is the isomerization unit in which normal butane in the presence of aluminum chloride, hydrogen chloride catalyst undergoes a molecular rearrangement to produce isobutane.

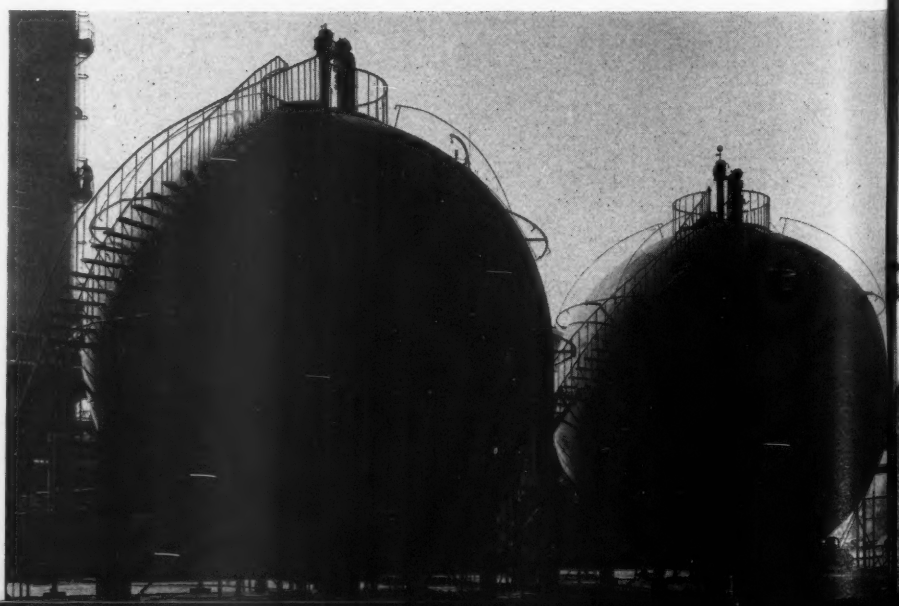
This isobutane is a necessary constituent in the feed stock to the alkylation unit wherein the isobutane is forced to react with olefins, the combination of which forms a product known as alkylate, the chief component of 100 octane gasoline. This reaction is based on the use of hydrofluoric acid as a catalyst, the feed stock being thoroughly mixed with the acid in temperature controlled contactors. The mixture is allowed to separate into acid and hydrocarbon phases in settling tanks, the acid being recirculated to the process and the hydrocarbon sent on to fractionating units to remove unreacted constituents and undesirable components. The unreacted constituents are recycled to extinction.

In the manufacture of 100 octane gasoline it is necessary to blend various components in order to obtain a balanced fuel. Choice of base stock is therefore a vital point. In order to obtain maximum production of the proper quality and balance, catalytic base blending materials are highly desirable. One of the characteristics that make the catalytic base stocks desirable is the aromatic content.

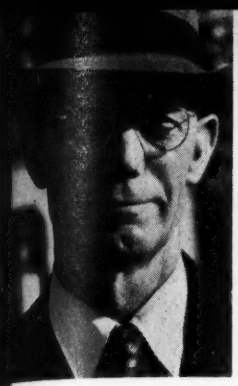
Fluid Catalyst

One method for obtaining these characteristics is the fluid catalytic cracking method which is an integral part of the Wilshire 100 octane plant. A powdered catalyst introduced into the oil stream and held in suspension by the recirculation of hydrocarbon gases through the mixture is the basic fundamental of the process. Cracking of the feed stock is carried out at low pressure and relatively high temperatures. The catalyst remains in suspension in the cracked mixture which is sent to the fractionation column for separation of the hydrocarbons from the spent catalyst. The resulting dry gas from this separation is returned to the gas concentration unit for further treatment. The used catalyst is rendered inactive by deposition of carbon formed in the cracking reac-

M. A. Machris, executive vice president, heads all departments concerned with the construction and operation of the refinery.

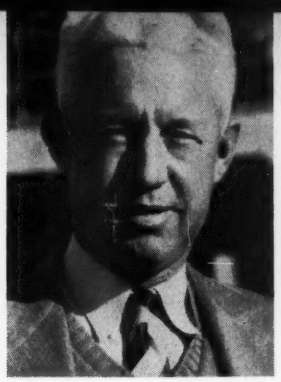


These 3000-barrel, 85-pound-pressure Hortonspheres are used for storage of feed stocks and blending agents in plant.



John Beddow, Wilshire refinery superintendent.

Fred B. Behrens is assistant refinery superintendent.



O. E. Liddell, chief engineer in the Wilshire organization.

Fred Scherf, chief chemist, supervises the testing lab.

William E. Conroy finery purchasing

tion. Burning of this carbon by the introduction of controlled volumes of air is accomplished in the regenerating unit. The resulting regenerated catalyst is then ready for recirculating for further use.

The flue gases from this system gases through waste heat boilers resulting in the production of steam used in the process.

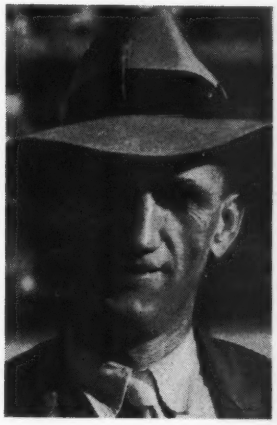
New Laboratory

The use of this base blend material with alkylate plus isopentane control panels are equipped with various types of recording instruments and gauges that enable the operators to observe and regulate the temperatures, pressures, speed of flow, etc. of each piece of equipment in the entire unit from one location, and to

W. Scott Smith serves as the company's refinery engineer.

William C. Gross, superintendent of the cracking division.

W. C. Hemphill, superintendent of the power division.



John Ouding is the superintendent of the chemical division.

tend to carry out catalyst which would be lost to the process. Control of this loss is accomplished by the use of Cottrell electrical precipitation equipment. Working in conjunction with this equipment are multiclone units. The heat generated in the regeneration of the catalyst is dissipated by passage of the flue

for proper vapor pressure balance results in the production of 100 octane fuel after the addition of tetraethyl lead.

The controls for the 100 octane plant are centralized in two controlhouses, one for the catalytic cracking unit and one for the H. F. alkylation and isomerization units. The

furnish permanent plant records.

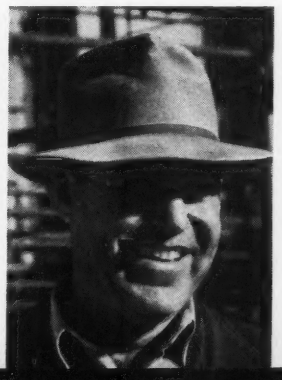
The manufacture of 100 octane gasoline has placed a new and stringent demand on the laboratories. A complete laboratory for testing all materials entering into the manufacture of aviation fuel and to control each step in the refinery operations, as well as the quality of the

Sam Lindsey is assistant refinery engineer.

Ben Arnold, assistant superintendent of cracking unit.

D. W. Patterson, Universal Oil Products construction engineer.

Ben Pennington, Fluor Corp's. construction superintendent.



R. H. Stubbings, in U.O.P. organiz

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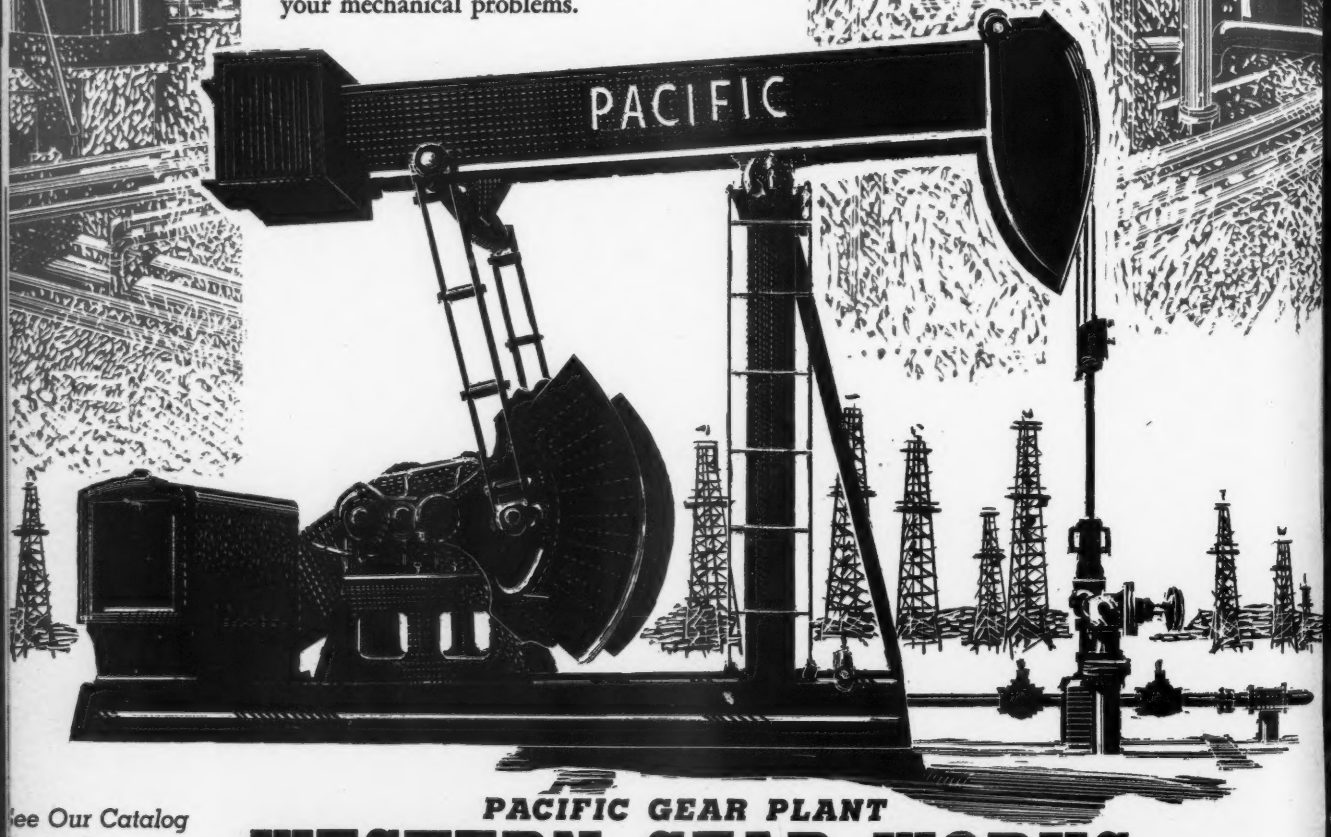

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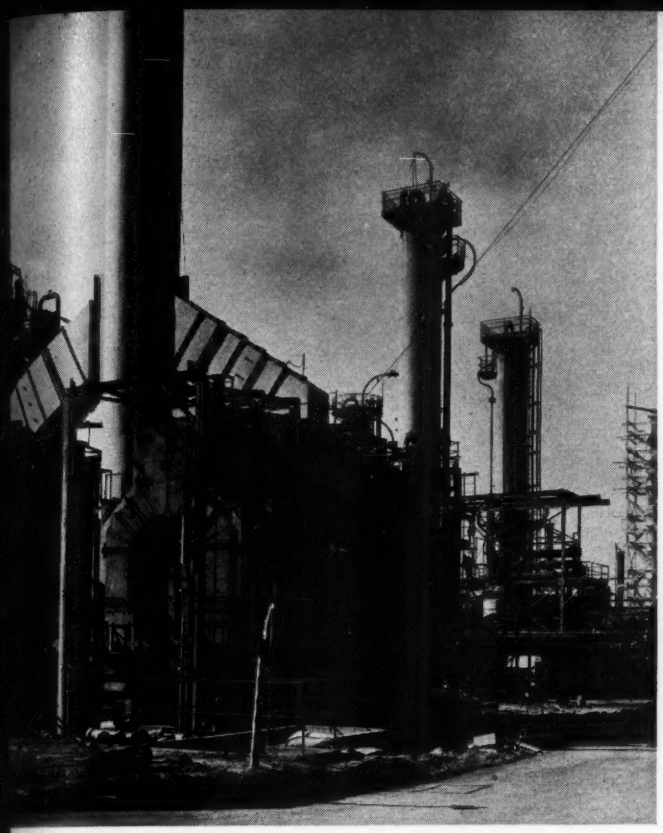
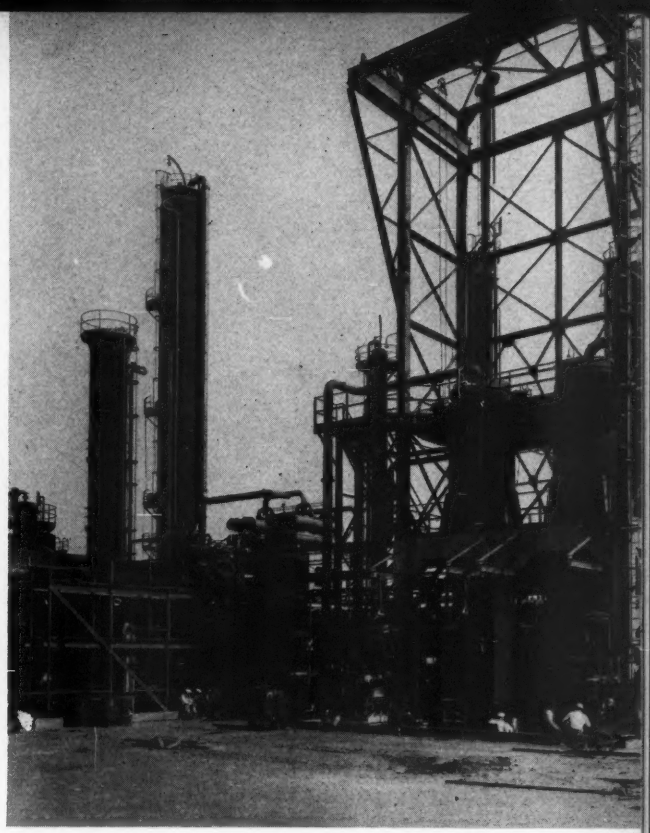


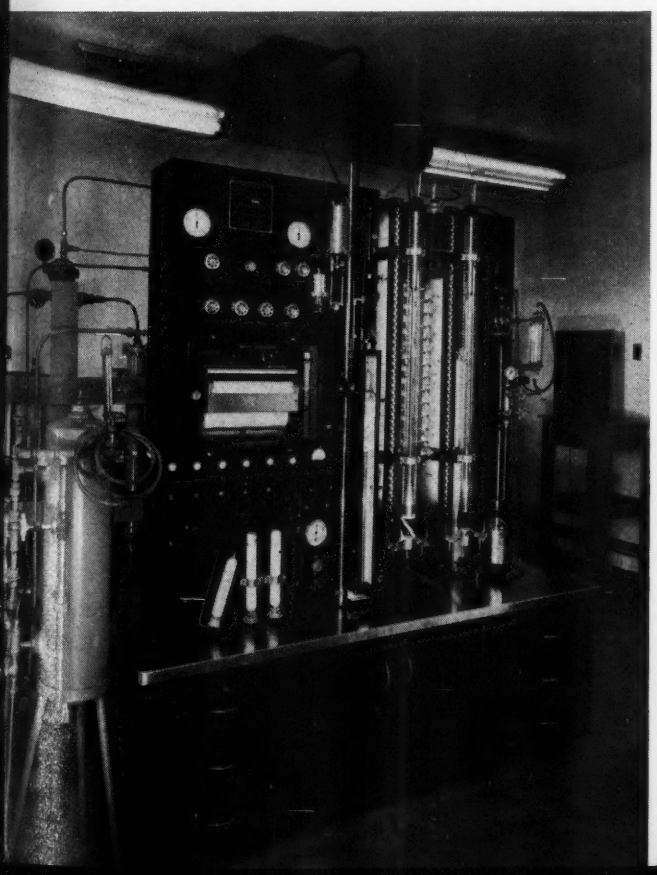
Reformer unit, built in 1938, increased the yield of high octane.



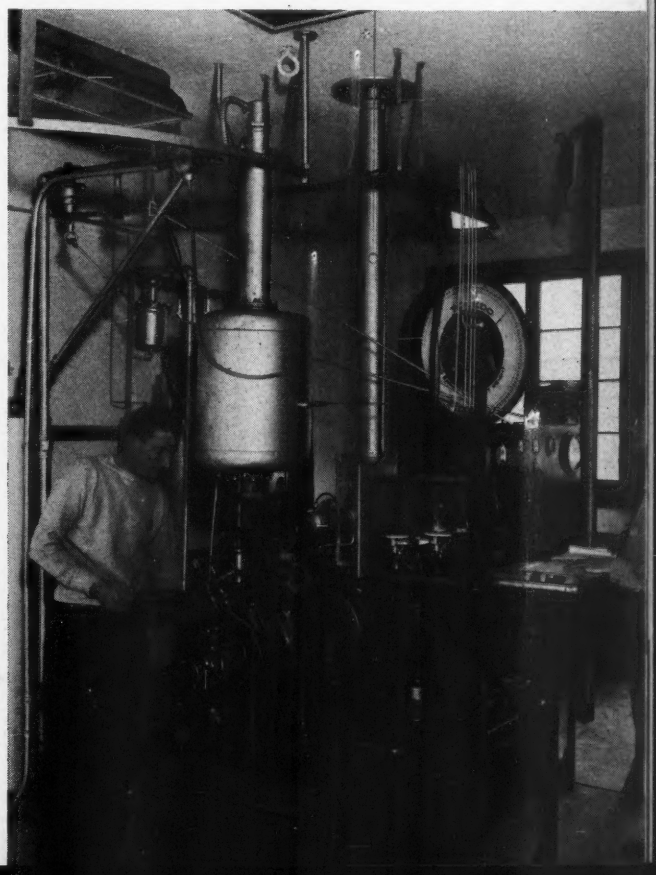
Gas concentration unit treats gas from catalytic cracking unit.

finished product, has been installed. Of the various analyses required, one of the most important is the fractional distillation of the gases entering the entire system. These are made by the use of high and low temperature Podbielniak Hyd-Robot equipment as well as by the infra red spectrophotometer.

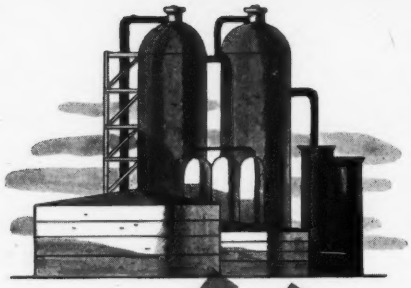
Low temperature Podbielniak Hyd-Robot gas analysis apparatus.



Operators test 100-octane aviation gasoline in 3-C test engine.

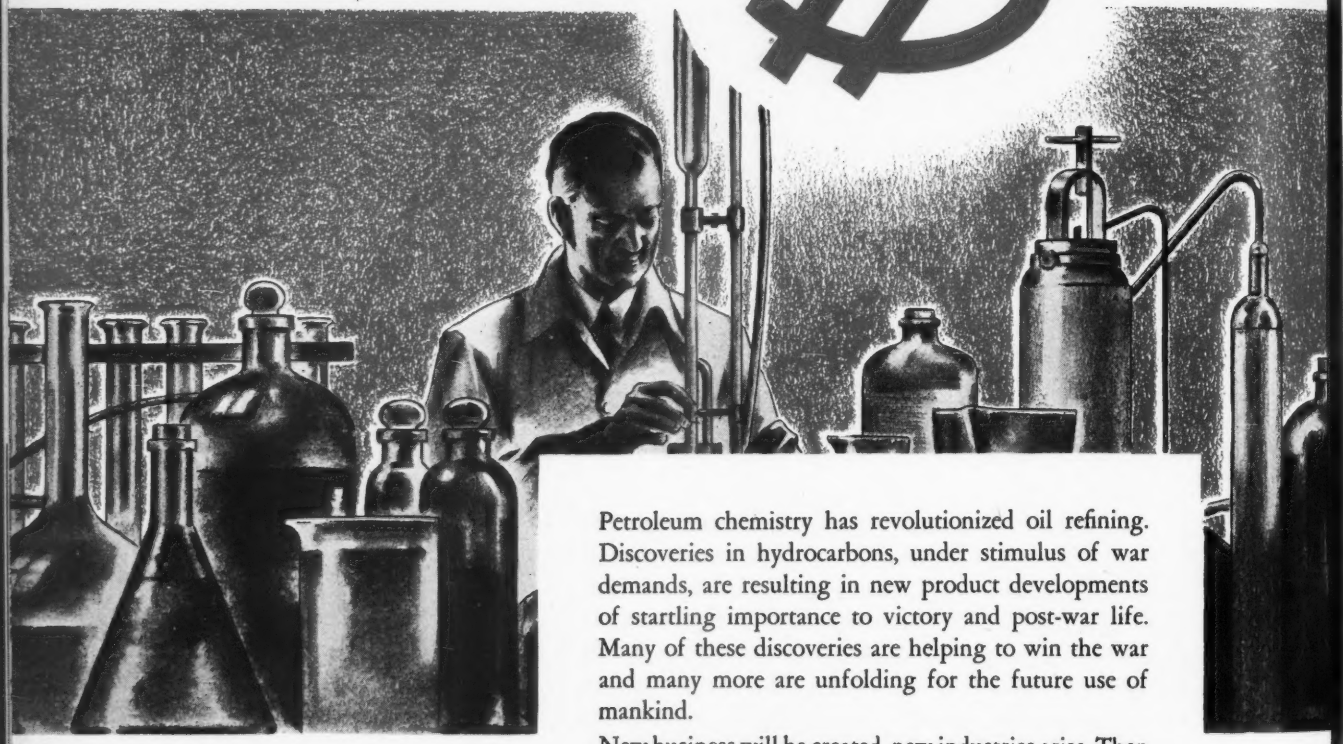


A finer, more abundant living
TODAY and TOMORROW
because of Petroleum Chemistry



Millions $

FOR RESEARCH, HAVE CAUSED A REVOLUTION IN OIL



Petroleum chemistry has revolutionized oil refining. Discoveries in hydrocarbons, under stimulus of war demands, are resulting in new product developments of startling importance to victory and post-war life. Many of these discoveries are helping to win the war and many more are unfolding for the future use of mankind.

New business will be created, new industries arise. Then will the world more fully appreciate the extent of oil industry's great contributions to more abundant living.

The Tret-O-lite Company has long shared in the service of the oil industry, providing accurate field tests and chemical compounds for crude oil demulsification.

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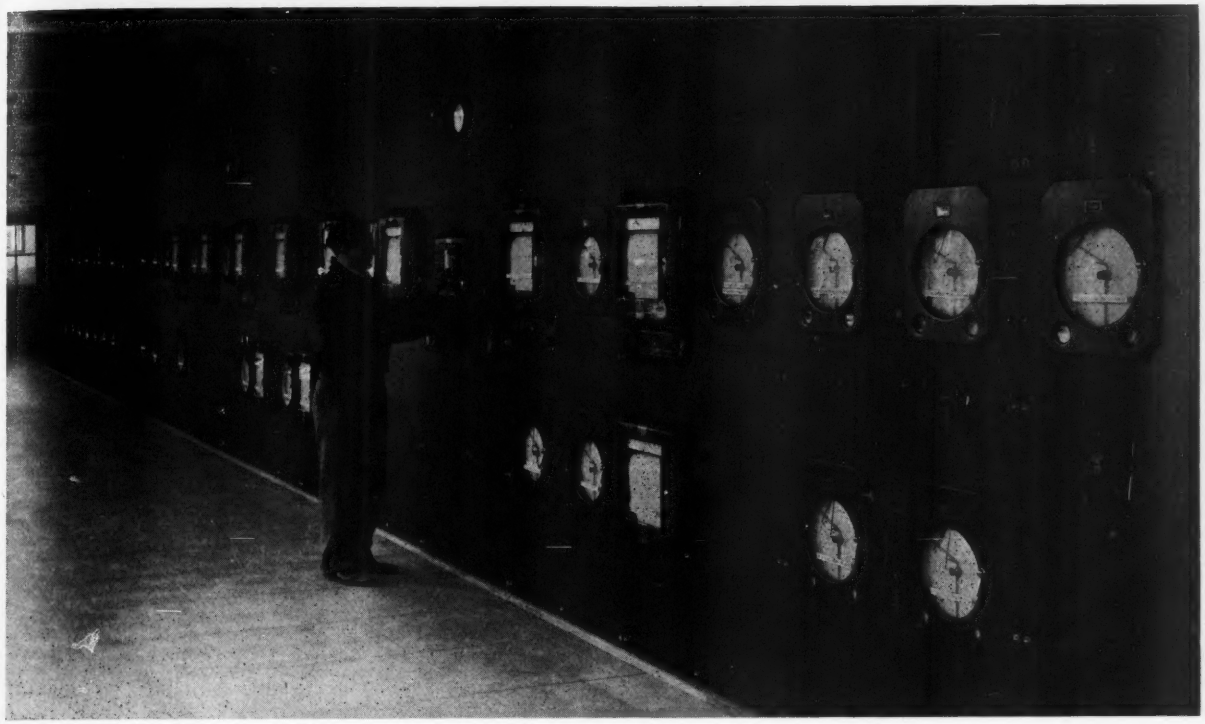


Control panel for H. F. alkylation and isomerization units. The catalytic cracking unit is operated from a second control panel.

Blending of the various components to given octane numbers represents considerable technique and is controlled by the use of test engines designed and built for aviation fuels only. Since the principal reason for the use of two engines of different design is to obtain information as to the performance of a fuel under different operating conditions and still attempt to approach actual flying conditions, operating technique and design are somewhat different on the two methods.

Pressure Storage

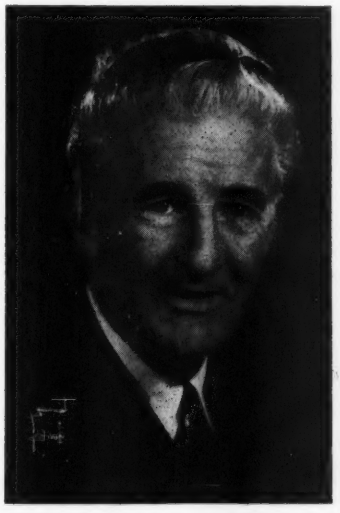
The Wilshire analytical laboratories headed by Fred Scherf, chief chemist, have been enlarged in order to keep a close control of all operating conditions. Today the age of Aladdin Synthesis requires the knowledge and techniques of analytical chemists to control the catalytic cracking and its numerous allied processes and ramifications in order that our armed forces may be assured of a supply of 100 octane aviation gasoline that will always perform uniformly and efficiently.

Pressure storage for feed stock and blending agents will be handled in two 3,000 barrel, 85 lbs. pressure, and one 3,000 barrel, 30 lbs. pressure, Hortonspheres.

Total storage in the unit provides for approximately 500,000 barrels to be utilized for rundown and blending, also for storage of finished products.

Adequate loading facilities for tank cars have been installed consisting of three sidings equipped with loading and unloading racks capable of handling 44 tank cars of finished products and their components. Another siding for the handling of warehouse material and chemicals has been provided along with facilities for handling tank truck and trailer shipments.

A barrelling plant located in this area is equipped with four conveyor lines and four scales that have a capacity of one barrel per minute each. The pumping equipment consists of two 200 G.P.M. centrifugal pumps



W. D. Smith is assistant secretary.

R. F. Forch, Wilshire's chief counsel.

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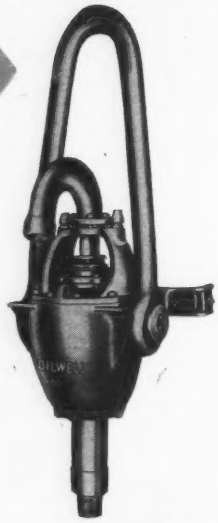
Ample capacity for present and future heaviest-duty service — depths to 17,000 feet; table speeds to 1,000 r.p.m.

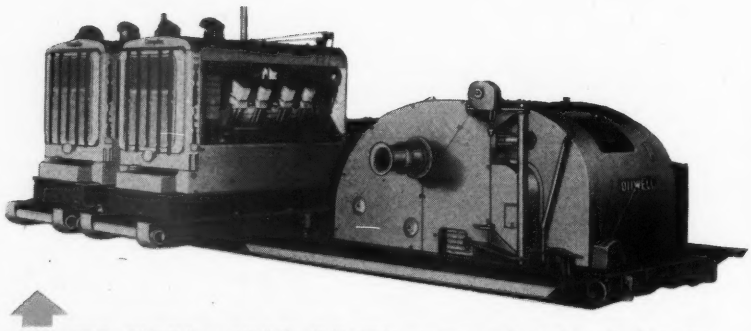
"Oilwell" 17½-Inch Oilbath Rotary. Although economically priced and of convenient size for portable power rigs, this quiet-operating rotary provides the dependable and trouble-free performance expected in a rotary of larger size and much higher first cost. Features include spiral-bevel gears and sealed, continuously circulating oilbath lubrication.

Ample capacity for most power-rig drilling—depths to 7,500 feet; table speeds to 400 r.p.m.

"Oilwell" No. 100-C Swivel. One of complete line of four modern streamlined swivels. There is an "Oilwell" swivel of ample capacity and economical size for every drilling requirement. Drilling depth ratings at 100 r.p.m. with 4½-in., 18-lb. drill pipe range from 5,700 feet for the No. 60-C to 17,000 feet for the No. 300-C.

Many of California's deepest wells, including the two deepest in the world, have been drilled with "Oilwell" Series 150 swivels. "Oilwell" Series 60 swivels are proving especially well adapted to the smaller power rigs in California.





"Oilwell" No. 64-A Universal Hoisting Unit. This compact and sturdy unit gives the dependable, trouble-free service California operators look for in a portable power rig for drilling medium depth wells. Its wide performance range makes it adaptable to a great variety of drilling conditions. An Airflex master clutch with convenient remote control simplifies and facilitates operation.

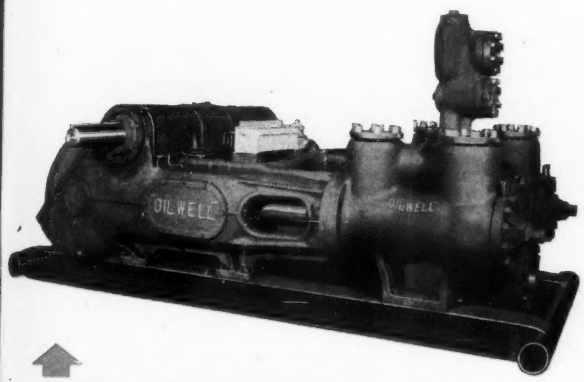
Efficient utilization of power output to meet the requirements of various drilling conditions is made possible by convenient "Oilwell" engine drives, including power take-offs for slush pumps.

"Oilwell" TC-23 Twin-Crank Pumping Unit. This is one of several sizes of "Oilwell" pumping units which are supplied with special frames for California derrick-floor installations. Notice how the cranks of this versatile TC-23 Unit clear the floor even when equipped with a full set of 22 pairs of counterweights.

Sizes and types assuring maximum economy for a great variety of pumping conditions are included in "Oilwell's" extensive line of field-proved pumping units. In addition, each "Oilwell" unit is designed to cover a wide range of operating conditions. It is easy to change speeds, stroke lengths and counterbalancing to suit changing well conditions.

TOMORROW'S . . .

oil industry can count on "Oilwell"



"Oilwell" No. 14P-HD Power Slush Pump. The "Oilwell" line of power slush pumps is complete with a pump of the right size, type and capacity to handle any job with the utmost economy and dependability. "Oilwell" pumps are readily adapted to special California operating conditions. Recently "Oilwell" engineers collaborated with a California oil company in designing a self-contained portable slush pump hook-up to suit unusual conditions encountered in a coastal drilling program. High volume and pressure capacity in relation to its size make the "Oilwell" No. 14P-HD (7¼" x 14") Pump particularly well suited for this special application, which also includes two engines and a dual drive in one compact unit.

What to look for in "Oilwell" supplies

"Oilwell" service in California is not merely supplying machinery and parts for drilling and pumping operations. It includes the furnishing of all kinds of equipment, tools and supplies for drilling and production operations and many pipe-line, refinery and miscellaneous needs.

In this line, which we confidently believe is second to none, you will find such high-quality products as

National Tube Company Pipe

American Steel & Wire Co. Tiger Brand Wire Rope

Plymouth Cordage

Thermoid Belting, Hose, Brake Lining and Other Mechanical Rubber Products

Also well-known makes of valves, fittings, tool joints, bits, tongs, elevators, cementing equipment, drive chain, hand tools, miscellaneous hardware and many other items.

For a handy reference book presenting a complete line of supplies available from one dependable source, we suggest you use "Oilwell's" new General Catalog No. 47. It's the most up-to-date catalog of its kind—well indexed—convenient for finding the information you want in a hurry.

TO oldtimers in the California oil fields, the names o R. H. Herron Company and Oil Well Supply Company its successor, have had but one meaning — a continuous friendly source of dependable equipment and service.

For 48 years—ever since R. H. Herron Company started as a dealer of oil field supplies in 1896—"Oilwell" and it predecessor have been a part of the California oil industry This is a long period of continuous service in this still young industry, but not nearly as long as we intend to make it. For whatever the future has in store for this important region there is one thing of which you can be sure—"Oilwell" will continue to provide the most helpful service possible.

Our definition of service is as meaningful as it is brief: t continuously provide courteous, efficient helpfulness in stor and field—to carry the most complete lines conditions wil permit—to furnish products best suited to the needs of eac oil-producing area.

You'll find "Oilwell's" field engineering service particularly helpful. "Oilwell's" field engineers are trained and experienced in assisting customers in the selection, installation operation and maintenance of equipment. Time and tim again they have helped California operators lick difficul problems and lower their drilling and production costs.

A few of the many "Oilwell" products which have won reputation for dependable service and outstanding perform ance are shown in this advertisement. For more complet information turn to pages 2233 to 2268 of the new COMPOSIT CATALOG OF OIL FIELD EQUIPMENT. Or, better yet, call at th nearest "Oilwell" store.

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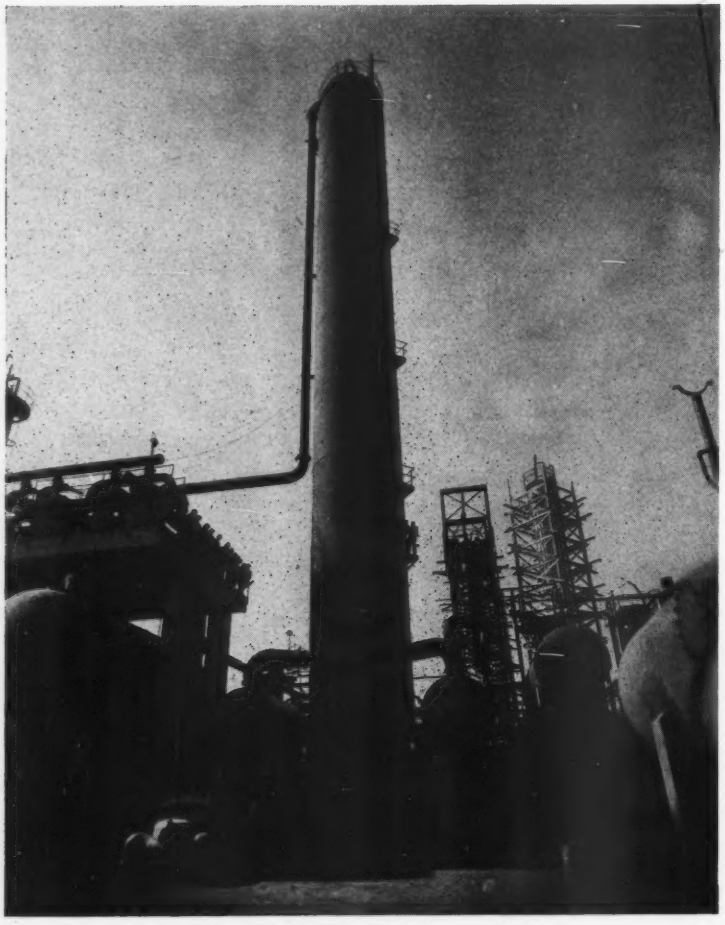
Turbo generating plant consists of three Westinghouse 1000 K.V.A. generators.



Deisobutanizer column.

with explosion proof motor drives for light products, and two 200 G.P.M. direct displacement pumps with explosion proof motor drives for lube oil. An automatic heating system for maintaining even temperatures in the lube oil is included in the pumping equipment. 5400 barrels of working storage has been provided, as well as storage space for 850 filled barrels. The plant can load 2,400 barrels per 24-hour day.

Two Foster-Wheeler boilers with capacity of generating 250,000 lbs. of super heated steam per hour at 450 lbs. pressure have been added to the present steam generating plant.

A turbo generator plant consisting of three Westinghouse 1,000 K.V.A. generators will furnish electric energy for the entire plant. Two of these generators are operated on 10 lb. exhaust steam and one acting as a standby operates on 150 pound steam. Condensing is carried out at sub-atmospheric pressure for maximum efficiency. The power division is under the supervision of W. C. Hemphill, power superintendent.

Refinery water cooling equipment has been installed consisting of one Fluor model 60-A-15 Aerator cooling tower which has a capacity of 10,000 gallons per minute cooling from 120° F. to 90° F. with wet bulb at 75° and a relative humidity of 40% and wind velocity of one mile per hour. This will operate in conjunction with the present water cooling system.

The capacity of this plant has been doubled since the construction started. This increase is due in part to information obtained from similar plants previously placed in operation and to the changes made in some of the cracking plant units, also to locating and removing bottlenecks and improving the operating technique by the Wilshire engineering and operating personnel.

The completion of this new $8,500,000 refinery identifies the Wilshire Oil Company, Inc., as one of the important producers of 100 octane aviation gasoline and other kindred products for the armed forces of the United States, and also places it in a position to meet the exacting post-war requirements of the civilian motorists.

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Uncle Sam is our biggest customer today and our No. 1 job is producing implements of war where only the highest quality is good enough for our fighting forces.

We are able, however, on proper priorities, to take care of many needs for our peace-time customers, and ask that you check with us on your needs—we'll do ALL we can to help.

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Carrington Lewis

Reports From Washington

What to do about the proposed Government-financed pipeline from the Persian Gulf to the Mediterranean Sea remains the $64-question in official Washington.

After recovering from the initial shock of Petroleum Administrator Ickes' revelation that a contract was under consideration between the Petroleum Reserves Corp. and three large American oil companies,—industry, Government and the public seem to have adopted the attitude that now is the time to sit down and take a good look at America's position with regards to the rich oil resources of the Middle East.

The relative calm which followed the proposal to span Saudi Arabia with a pipe line costing from $130,000,000 to $165,000,000 speaks well for the educational campaign that Government and the oil industry have been conducting . . . An oil-rationed public at last seems convinced that domestic reserves are dwindling and that the U. S., in the future, must look to her foreign resources if she is to maintain her place as one of the great oil powers of the world.

This does not mean that the agreement between PRC and the Arabian American Oil Co. (owned by Standard Oil Co. of California and The Texas Co.) and Gulf Exploration Co. (owned by Gulf Oil Corp.) has been endorsed either by Congress or by certain industry factions. Plenty of suspicion still exists in some quarters as to the motives underlying the proposed venture, and a very thorough investigation is guaranteed before the plans will be allowed to mature.

Typical of the reaction of the more cautious element of the industry was the comment of the Independent Petroleum Association of America, which recalled the organization's stand against Government participation in the oil industry "either abroad or at home." Although reluctant to take a stand on the issue at this time, the IPAA sagely observed:

"As someone has aptly said, 'This project is like an iceberg — only a small portion of it is visible.' It is the unseen portion that sinks ships."

The pipeline announcement, at any rate, precipitated what undoubtedly will turn out to be one of the most searching investigations of the U. S. petroleum picture ever attempted by Congress. With Ickes scheduled to appear before a subcommittee of the Senate Foreign Relations Committee Feb. 15, to "show cause" why PRC should not be dissolved completely, the subcommittee was discharged on the eve of the hearings by Chairman Edwin C. Johnson of Colorado, and formation of a new committee (with a "broader scope") was agreed upon.

The new committee, authorized by the Brewster-Moore resolution, will comprise three Senators from each of three powerful Senate committees, Foreign Relation, Interstate Commerce, and Commerce.

An investigation of the "witch-hunt" variety was proposed, Feb. 16, by Representative Jerry Voorhis of San Dimas, who called for an 18-man House Committee, whose principal chore would be to probe affairs of major oil companies.

Declaring need for a determination of the facts by a "truly independent government agency which will get its information from sources other than the controlled findings of the major oil companies themselves" Californian laid down seven-point program of which four points concerned themselves with activities of majors.

Committee — comprising three members each from House Naval Affairs; Interstate and Foreign Commerce; Agriculture; Military Affairs; Public Lands and Mines and Mining Committees — would investigate:

"Extent of holdings of various oil companies (of U. S. reserves) with particular reference to degree to which they are owned by major-integrated oil companies. Extent to which monopolistic practices exist in petroleum industry.

"Policies pursued by the major oil companies with regard to control over production. The handling of reserves, the management of pipelines under their ownership, the distribution and marketing of petroleum products, and any other related and pertinent matters.

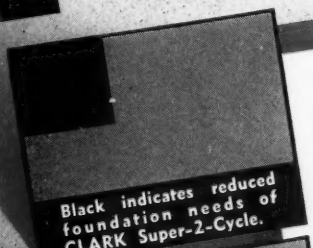
"Relationship of various groups in the oil industry to Federal and local governments in the United States."

Coincidentally, the Truman Committee investigating the National Defense Program came out with a report on petroleum based on the findings of the famous "five-Senator" subcommittee which made a world tour last summer. In its conclusion, the report said that:

"The committee is very strongly and unanimously of the opinion that the Senate should give immediate consideration through the appropriate legislative committees to the determination of a petroleum policy for the United States that shall take properly into account both the domestic and foreign field and critical importance of petroleum in our national defense as well as our national well-being.

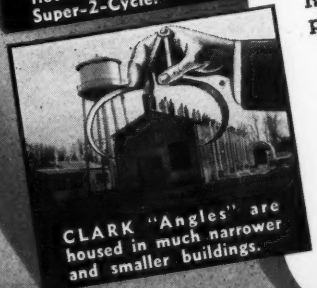
"The security of the United States today is dependent upon adequate supplies of petroleum. The economy of the United States is also to a large extent dependent upon petroleum.

2-CYCLE *has* LOWEST INSTALLATION COST



Black indicates reduced foundation needs of CLARK Super-2-Cycle.

Black indicates reduced floor space for CLARK Super-2-Cycle.



CLARK "Angles" are housed in much narrower and smaller buildings.

More Compact for Power Delivered!

2-cycle design, as perfected in the CLARK "Angle" Compressor, has tremendously reduced installation cost per horsepower, for these basic reasons:

1. 2-cycle design eliminates the "waste stroke" of 4-cycle operation . . doubles the power per cylinder. This means maximum compactness per horsepower.

2. The vertical power cylinder further achieves compactness. Results: Shipment almost completely assembled . . smaller foundations . . smaller buildings . . minimum length of piping.

The CLARK 2-cycle offers greater fuel economy, less wear, smoother operation, fewer man hours, simpler construction. Investigate fully.

CLARK BROS. CO., INC. - OLEAN, N. Y.

Export Offices: 30 Rockefeller Plaza, New York. Domestic Sales Offices and Warehouses: Tulsa, Okla.; Houston, Texas; Chicago, Ill. (122 S. Michigan Ave.); Boston, Mass. (131 Clarendon St.); Huntington Park, Calif. (5715 Bicket St.) Foreign Offices: 72 Turnmill St., E. C. 1, London; Avda Roque Saenz Pena 832, Buenos Aires.

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CLARK

Super-2-Cycle

"Failure to make proper provision for adequate petroleum supplies for for the United States during the next few decades will vitally affect both our security and our development.

"The critical importance of petroleum in the world economy is emphasized in the current emergency. There have been suggestions that international arrangements may be considered assuring the access of all nations to petroleum reserves for their peacetime economy upon an equitable basis.

"Such a possibility accentuates the imperative necessity of an early determination of a national policy on petroleum by the Congress."

A not-inconsequential angle to American expansion in the Middle East is the stir created in Great Britain by reports of the pipeline project. For, while American enterprise in the Saudi Arabia area has been "relatively unprotected by American diplomacy"—to quote the Truman committee report—the British Government has heavy stakes in the Middle Eastern petroleum resources and a lively interest in anything affecting the area.

Although no definite decision has been reached as to the route that will be taken by the pipeline—providing it becomes a reality—it is presumed it would cross Saudi Arabia from the Persian Gulf and terminate either in Palestine or in Egypt. Thus it would pass through only two British-mandated areas — Trans-Jordan and Palestine.

Except for possible concern over increased U. S. enterprise, most officials in Washington feel that a pipe-line passing through British-owned property should not unduly arouse the British. Some officials actually are rather pleased at the reaction abroad, as they feel former criticisms and complaints that this country is aiming for a "secret agreement" with the British Government on the Middle East oil properties have been nullified by the protests from England . . . It must be borne in mind, however, that the proposed pipeline cannot be constructed without formal, lengthy and friendly discussions with His Majesty's Government.

Assuming the project is approved and completed, the advantages to American interests using the line can be readily appreciated. Some 3400 miles of tanker-travel would be saved by installation of a pipeline, as products shipped from the Persian Gulf coast — where the big Bahrein Island refinery and other American projects are located — must go through the Persian Gulf, the Gulf of Oman, the Arabian Sea, the Gulf of Aden and the Red Sea, before reaching the Mediterranean.

Before this issue of CALIFORNIA OIL WORLD hits the street, it is probable the nine-man Senate committee will be up to its neck in hearings that may last several months. As this is being written, however, the committee has not yet been appointed. While the fate of PRC presumably will be decided by the Senate group, and the construction of the Saudi Arabia pipeline depends on its decisions, the committee also has been charged with the responsibility of investigating all aspects of the domestic oil situation . . .

Details of the proposed pipeline project are to be found elsewhere in this issue, so we will beg to be excused from any further comment on the subject . . . Some of the highlights of the Truman Committee report deserve more mention than they can receive in a limited space, and the new campaign to open up Naval Petroleum Reserve No. 4 in Alaska is getting "hot." The Elk Hills situation and prospects for a rise in crude prices also must be touched upon.

This means a lot to condense within the next few columns.

Since there isn't space in which to do justice to his committee's report, we'd like to lead off with a compliment to Sen. Harry S. Truman of Missouri. Cynical Washington does not hold much stock in the reports of the countless Congressional committees, but the output of Truman and his able staff almost always is considered page-one material. The petroleum report of Feb. 16 is well worth reading.

Four "approaches" were suggested in the report to the solution of the petroleum problem. Briefly, these are:

1. Continuation of the present policy of "leaving American companies interested in foreign oil fields free to take whatever action they may determine upon with Government assistance limited to that available through normal diplomatic channels." The report points out that this course "would be apt to result in difficulty for the private American oil companies concerned" because of the consciousness of other countries "of the critical importance of petroleum to their national security."

2. Full diplomatic backing by the U. S. Government for American enterprise in exploring and developing foreign petroleum reserves . . . . "This would mean a recognition by our Government of the vital concern of our country in foreign petroleum reserves . . . the same sort of vigorous support that is accorded by certain other governments to their nationals abroad in cases where their national interest, as distinct from the private interest of citizens, is vitally involved."

Seemingly the committee preferred this second course, as the report commented that it "retains the full advantage of private initiative while at the same time according protection and encouragement flowing from the recognition of the national interest involved."

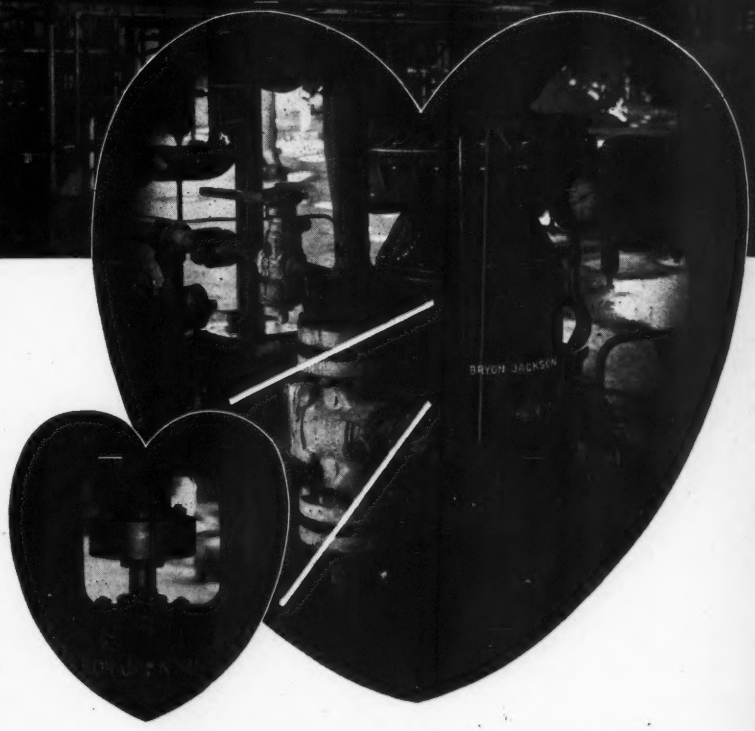
3. Participation by the Government in the ownership of concessions.

4. Sole ownership of certain foreign oil reserves.

"The latter possibility can immediately be ruled out," the report stated. "If there had been no incentive for private initiative, our concessions at Bahrein Island and in Saudi Arabia would never have been obtained. Complete Government ownership of foreign oil concessions would presuppose a radical change in our economic system."

The Truman Committee joined many other Congressional groups in stressing need for a single agency under which America's future petroleum policy can be integrated and

THE HEART *of Every Refinery...*



...IS ITS PUMPS

.. and Byron Jackson HYDROPRESS Pumps are the heart of this modern California high octane gasoline refinery. Out of a total of 8 HYDROPRESS Pumps in service, three of the type illustrated at right are 15-inch, H, 6-Stage Coppus Steam Turbine driven, each delivering 190 g.p.m. of **HF** Acid Solution against a 1260-foot total dynamic head, operating at 3,550 RPM.

Byron Jackson Pumps are ideally suited to *every* phase of advanced refining operations, and capable Byron Jackson Engineers are available for consultation and recommendations on *every* application.

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THE HEART OF THE PUMP IS ITS STUFFING BOX

For handling this extremely hazardous **HF** Acid Solution, conventional packing is used in the stuffing box of each HYDROPRESS, the design of which incorporates a safety device effective in the event of packing failure.

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under which present oil problems can be dealt with. Mr. Ickes appeared to be their candidate.

"He deserves high praise for this accomplishment," the report said, commenting on the "excellent job" Ickes has done on making available petroleum products in the face of transportation difficulties. "It is also significant that the operating agencies which worked with him, such as the Office of Defense Transportation, were able under this arrangement to turn in so remarkable a performance. He testified fully before this committee in executive sesing technique by the Wilshire engision."

The Truman Committee indirectly took a good swipe at Gen. Brehon D. Somervell and his Canol project.

"The Petroleum Administrator has testified that he learned of extensive foreign explorations which were conducted by the War Department only accidentally "in the lobby of the Mayflower (one of Washington's leading hotels)", the report stated. "The War Department's foreign operations have not been limited to a single field, and operations on a large scale and proposals of great significance have been considered without consulting the Petroleum Administrator."

Regarding the proposed foreign operations, the Committee said:

"This diffusion of administrative authority is our present means of approach to as delicate and complex a diplomatic and economic situation as can be found in the world."

* * *

Well . . . the newest shocker for the nation's capital was the speech made by Rep. Norris Poulson, of Los Angeles, pressing for immediate development of Naval Petroleum Reserve No. 4—located at Point Barrow, Alaska. Armed with facts and figures collected from sterling witnesses—such as Wallace E. Pratt, vice president and director of the Jersey Company, and Lieut. William T. Foran, U.S.N.—a petroleum geologist with much experience in South America, the Near East and Alaska—Poulson plumped for immediate development of some 35,000 square miles of Navy-owned property in the "non-glaciated" southeastern Alaska field.

According to the Californian, the Point Barrow reserve has infinite possibilities and may well turn out to be a second East Texas. In a speech on the House floor, Poulson told of oil seeping through the tundra moss; oozing from the "gentle slopes" in the vicinity of the rich oil deposits . . . The Navy's No. 4 reserve has never been tapped, although the lands have been owned by the Navy for 23 years.

Reminding his listeners that he had been recorded as violently against the Canol project, Poulson predicted the new Alaska find could be developed by Navy "Seabees" in time to be of help to the present war effort. Equipment and supplies, he said, could be flown to Pt. Barrow from Fairbanks,—already a great air transport center, flying supplies to the China and India fronts.

With regard to the Pt. Barrow reserve, Poulson said:

"Mr. Foran tells me that the seepages there at Cape Simpson are undoubtedly the result of a slightly fractured oil pool, with fault vent to the surface, and that this occurence is evidence of the most possitive nature that oil has accumulated in the subjacent area. He says that no less than eight major anticlines suited to accumulation of oil traverse the Reserve area from East to West. The source region for oil in this region, according to Mr. Foran, is suggested by the presence of rich oil shales occurring in the zone below the coal series, and he notes that porosity, sand, and shale conditions in this lower series are well suited to the migration and pooling of oil. His analysis of the residue of the seepage oil suggests that it is comparable to Gulf Coast crude and quite similar to crude from the Blue Ridge Field of Texas."

Quoting Foran, Poulson said that Pt. Barrow was "one of the most attractive untested areas on the whole North American Continent." He pointed out "deep and expensive failures" — such as Standard's attempt from 1923 to 1926 to drill the "most attractive looking structure" in the Alaska region and efforts of Associated Oil Co. of California to drill in approximately the same region.

Surveying these failures, the "Navy put their own fence around the 35,000 square miles of land which everybody agrees is the most likely oil land in Alaska," Poulson said.

As to WHO should develop this allegedly great reserve, the Californian had this to say:

"For that question I do not have an answer, but I want to see responsible authorities get to work NOW to FIND the best answer. With its splendid organization of Seabees, (Construction Battalians), the Navy itself could develop it. Maybe the Army and Navy should develop it together. Maybe it should be developed with funds provided by the Petroleum Reserve Corp. Maybe it should be turned over to private industry to develop. It is certainly true that thus far in the history of oil development, private companies alone have shown the continuous initiative and enterprise which gets things done, and, under the pressure of constant competition, gets them done without the extravagant waste of time, money, material and manpower."

Since an argument for the development of remote Alaska oil fields naturally brings up a horde of questions centering on transportation, supplies equipment, etc., it is natural to expect considerable opposition to Poulson's plan. However, encouragement from such able petroleum geologists as Pratt carry weight with the oil industry.

One objection most certainly will be made: As long as the Navy Department is balking at further development of Standard of California's Elk Hills properties—held at 15,000 barrels a day, despite an official request from Petroleum Administrator Ickes for 50,000 barrels —who would expect any great interest in opening up a remote Naval reserve 500 miles from Fairbanks, Alaska? If the Navy doesn't want to produce from the proven Elk Hills

(Continued on page 52)

Goodbye Curtailment; Hello Shortage!

After Years of Proration California Last Year Experienced a Soaring Demand Which Opened Wells to Their M E R's; Wildcatting Produced Little New Oil

By V. H. Wilhelm

California had a record year in production and drilling activity in 1943, but the results have not been sufficient to keep pace with the enormous increase in demand due to war activity.

During the year 114 dry wildcats were drilled, 129 dry wells in proved areas, 31 gas wells, and 1155 successful oil wells for a total of 1429 wells, compared to a total of 670 in 1942.

With production of 283 million barrels for the year, total reserves of California oil decreased over 200 million barrels.

The completion of 1155 wells served only to maintain the maximum efficient daily rate of production for the year at 777,000 barrels.

There is evidence in many fields that oil is being withdrawn too rapidly to obtain the maximum recovery, and more rapidly than is conducive to good production practice.

Supply and Demand

Steadily mounting needs of the military forces and increased industrial consumption raised total demand for all petroleum products on the Pacific Coast to 915,000 barrels daily in 1943. That all-time record demand was 150,000 barrels daily higher than in 1942 and 215,000 barrels daily above 1941 demand. Despite restrictions due to shortages of critical material, crude oil production was boosted from 680,000 barrels daily in 1942 to 777,000 barrels daily in 1943, the highest level in fifteen years. However, new crude supply plus natural gasoline production and imports from other states totaled only 841,000 barrels daily, leaving a deficiency between supply and demand of 74,000 barrels daily.

That shortage had to be made up by withdrawals from inventories which had been steadily reduced during the previous four years. Aboveground reserves, which totaled 159,574,000 barrels on January 1, 1939, were down to 100,000,000 barrels at the end of 1943. Significantly, the greater part of that decrease occurred during the last six months of 1943 when nearly 23,000,000 barrels were taken from inventories of both crude and products. Although the size of total inventories on December 31, 1943, might appear substantial, nearly 70% was made up of crude petroleum and heavy residuum. Considering further that a large portion of the remaining refined products in storage are needed to carry on operations, it is evident that the inventory situation was distressingly critical at the beginning of the new year.

Shortly before the close of 1943, the gasoline situation had deteriorated to such a degree that refiners were allocating civilian supplies to distributors. Despite curtailment of civilian use, gasoline demand was running over 300,000 barrels daily (including naphthas) in the last quarter of 1943. The average of 271,000 barrels daily for the full year was 15% higher than in 1942 and was 27% above demand just prior to the war. Although more gasoline was produced in 1943 than ever before and some of it was put in storage during the first few months of the year, finished and unfinished stocks were 4,000,000 barrels lower on December 31, 1943, than at the beginning of the year.

A paper read before the Annual Meeting of the A. I. M. E., New York City, Feb. 20. The author is a Commander, U. S. N. R., Los Angeles, Calif. The opinions or assertions contained herein are his alone and are not to be construed as official or reflecting the views of the Navy Department or the Naval service at large.

With a large portion of the remaining inventory consisting of aviation gasoline and unfinished distillate needing further treating and processing, what might be called "civilian reserves" were practically exhausted. With no prospect of improvement in sight, due to the tremendous military demand for both aviation and motor gasoline, the civilian consumer is faced with the necessity of voluntarily holding down consumption to a much lower figure than last year or accepting stricter rationing possibly on a "priority" basis.

Record Fuel Oil Demand

Demand for residual fuel oils also was at an all-time high in 1943, as millions of barrels were delivered to the Navy for its Pacific operations. In addition, rairoads and industrial equipment were operating under peak load conditions, all contributing to a total heavy fuel demand of 445,000 barrels daily, 26% above 1942 and 70% higher than the 1940 demand.

Although heavy fuel productions also established a new record of 400,000 barrels daily in 1943, it was 45,000 barrels daily short of requirements, some of which were restricted. As in the case of gasoline, the deficiency between fuel oil supply and demand grew from 23,000 barrels daily in the first five months of 1943 to 59,000 barrels daily in the last seven months. Reserves built up during the period of excess supply in 1937, 1938 and 1939 were gone before the start of 1943 and last year's draft of 16,000,000 barrels reduced fuel residuum stock to 28,000,000 barrels on December 31. With better than two-thirds of that amount considered necessary for processing and operating reserves, and demand considerably in excess of supply, it seems only a matter of time before available fuel

reserves are exhausted. At that time fuel consumption also will have to be reduced to a figure commensurate with production.

NEW DISCOVERIES—OIL

San Joaquin Valley

The Pleasant Valley, or Guajarral Hills field, was the only oil field of importance discovered in the state during the year. The discovery well, Standard Oil Co. well 82-29 F, S.29, T.20-S., R.16-E., one mile southeast of the Coalinga Nose field, flowed at the rate of 819 barrels of 28.5 gravity oil from a depth of 9142 feet, from Eocene sands. The new field is a permeability trap, or shore line, bordering the southeast end of the Coalinga Nose field. Productive area is expected to be 400 acres, in a long narrow north and south strip.

On the Tejon Ranch, six miles east of the Wheeler Ridge field, Richfield Oil Corp. discovered an accumulation of heavy oil after drilling four dry holes. The discovery well, Tejon 5, had an initial production of 70 barrels of 18.2 gravity oil. The well is producing from overlapped Chanac oil sand of Pliocene age.

Midway between Helm and Riverdale, the General Petroleum Corp. discovered a new field by the completion of its Burrel 68-35 flowing 342 barrels a day of 31.4 gravity oil from 12 feet of Temblor sand of Miocene age.

During the year the Helm field, discovered and controlled by the Amerada Petroleum Corp., was extended by the Superior Oil Co. In the north end of the field Amerada has succeeded in obtaining production from Eocene sands. This field now has a productive area of 3380 acres. The previous production from Temblor sands had failed to maintain sustained production because of the thinness of the sand and high gas-oil ratio.

The Seaboard Oil Co., in partnership with the Tide Water Associated Oil Co. and Union Oil Co., extended the Raisin City field in Fresno county one and one-quarter miles to the northwest by the completion of well S.T.U. 53-14 for 480 barrels daily of 24 gravity oil from a depth of 6305 feet, from sands of Eocene age. Previous production in the field was from thin Miocene sands.

Later the Seaboard Oil Co. extended the productive area of the Raisin City field an additional mile to the west by the completion of San Joaquin 1-1 for 100 barrels of 22.4 gravity oil and 1,000 m.c.f. of gas from a depth of 5020 feet from thin Miocene sands. All of the fields discovered in the San Joaquin Valley north of Coalinga in recent years are producing from very thin sand thickness and do not add appreciably to oil reserves.

The war boosted total demand for all petroleum products in 1943 to an all time high of 915,000 barrels per day, an increase of 20 per cent over 1942, and 31 per cent over 1941. Production of crude oil in California last year reached the highest point in 15 years (and presently is at the highest sustained rate on record.—Ed.)

Despite increased production, however, West Coast demand in 1943 exceeded supply by 27,000,000 barrels and, at year's end, the inventory position of the companies was critical. Extraordinarily heavy drafts were made on fuel oil and motor fuel stocks. The industry will be especially hard put to fill fuel oil orders in the coming year in view of the rising tempo of war operations in the Pacific.

Oil and gas well completions in California last year were surpassed in only one previous year—1924.

The Pacific Western Oil Co. discovered a small field north of Kern Front and west of Mount Poso oil fields by the completion of Enos No. 6, pumping 26 barrels of 12.2 gravity oil. Production is from the Chanac sand of Pliocene age and closure is either by overlap or faulting.

A small fault line field was discovered two miles west of the Round Mountain field by the Bandini Oil Co. with the completion of "Signal Mills" No. 1 for 150 barrels of 16 gravity oil from a depth of 2435 feet. Production is from the Vedder sand of Miocene age and the productive area is estimated at 80 acres.

In the McClung area in Kern County, another small discovery was made by the Continental Oil Co. with the completion of K.C.L.-G No. 1 at a depth of 7518 feet with an initial production of 250 barrels daily from sand of Miocene age.

The Republic area of the Midway field near Fellows was extended for 50 additional acres by the completion of Chanslor-Canfield Midway Oil Co. well No. 79-6, for 173 barrels of 20.4 gravity oil from 3070 feet, from the Republic sand of Miocene age.

The Standard Oil Co. extended the Greeley field for a half mile to the south by the completion of its Wegis Community No. 1 for 300 barrels of 35 gravity oil from a depth of 11,600 feet from the Vedder sand of Miocene age.

Coastal and Los Angeles Basin

No new fields were discovered in these districts. There were added, however, several new pools and extensions of old ones.

Two new pools were discovered in the Del Valle field in Los Angeles County. East of Del Valle R. E. Havenstrite, in his Barnes No. 2, discovered the Bering pool at a depth of 9629 feet. Formation is of Miocene age. Initial production was 1600 barrels daily of 43 gravity clean oil. West of Del Valle Bankline Oil Co., in its Sterry No. 101, discovered the Sterry pool at a depth of 4500 feet. Formation is of Miocene age. Initial production was 100 barrels daily of 23 gravity oil with some water.

A new zone was discovered in San Luis Obispo County by the Los Nietos Co. in its Scott No. 1 well. This is a small well producing from sand of Miocene age at a depth of 3155 feet.

Standard Oil Co. extended the Cat Canyon field in Santa Barbara County by the completion of its South Basin-Lloyd Community No. 1 at a depth of 4705 feet in sand of Miocene age. This is a 100-barrel pumper of low gravity oil.

Los Nietos Co. extended the Bardsdale field by the completion of its Elkins No. 1 well at a depth of 4919 feet in sand of Miocene age. Initial production was 125 barrels daily of 29 gravity oil.

The intensive wildcatting activity of the year, 129 wells, did not re-

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sult in hoped-for discoveries and additions, but it did develop six small fields and seven extensions of old fields. However, in the main, all the discoveries of the year are small and additions to reserves from new fields will not be over 20,000,000 barrels.

NEW DISCOVERIES—GAS

The year 1943 was remarkable for the number of gas fields discovered. All of these fields are located in Northern California and were the result of geophysical exploration.

Near Lodi, in Sacramento County, three gas fields were discovered, two of which are very small in area and produce gas of doubtful value because of the presence of from 21% to 34% nitrogen. The important discovery was made by the Amerada Petroleum Corp. with the completion of its Capital Company No. 1, producing 6,800 m.c.f. from a depth of 3390 feet. Production is from Eocene sands, with an average thickness of 30 feet. Subsequent development indicates that the total productive area is not over 500 acres. The gas is marketable as it contains 972 btu. with 7.2% nitrogen.

Six miles north of Lodi and six miles west of the Amerada discovery, Bankline Oil Co. discovered a one-well field by the completion of its Community 1-1 for 8,000 m.c.f. from the Capay sands of Eocene age at a depth of 2340 feet. The gas has a 34% nitrogen content with a btu. value of 680.

Three miles northwest of the Bankline discovery, Amerada discovered a small field by the completion of its Lodi Community 9-1, producing 7,200 m.c.f. from a depth of 2270 feet in the Eocene sand. The gas contains 21% nitrogen with a btu. value of 750.

Near Mendota, The Texas Co. discovered a gas field, with the completion of its Gill 14-16, for 4,900 m.c.f. from a depth of 4500 feet from Domingine sands of Miocene age. The gas is 97% methane with a btu. value of 1020. Net sand thickness is 23 feet and the estimated productive area is 600 acres.

Five miles northwest of the Gill field, The Texas Co. discovered the Moffat field with the completion of its Moffat 1-7 for 7,000 m.c.f. from a depth of 4308 feet. Production is from the Eocene sands with an estimated productive area of 500 acres.

The most important addition to gas reserves of the year was the discovery of deeper gas sands in the large Rio Vista gas field. Standard-Texas Midland Fee No. 5 was brought in producing 20,000 m.c.f. from 180 feet of Eocene sand. Approximately 4,000 acres of the 25,000-acre area of the field is underlain by this sand.

In Colusa County the General Petroleum Corp. discovered a new gas field by the completion of its Capital No. 1 for 4,500 m.c.f. from a depth of 2940 feet.

The year just past was unique in California oil history. Never before were so many discoveries made and so little oil found. New areas opened by the drill produced only small quantities of oil per well and were small in areal extent.

An aggressive wildcatting campaign failed to result in hoped-for-major discoveries, although it did uncover six small fields and seven extensions to oil fields. The Pleasant Valley field was the only discovery of importance.

Additions to reserves from these discoveries probably will not be over 20,000,000 barrels.

The year was noteworthy for the number of gas field discoveries. All are in northern California and are the result of geophysical exploration. The most important addition to gas reserves was the discovery by Standard of California of deeper gas sands in the Rio Vista field, initial well being brought in for 20,000 m.c.f. per day.

Richfield Oil Corp. discovered a new gas field in Butte County in its Chico No. 1 well. Formation test showed a production of 13,000 m.c.f. per day from a depth of 4,360 feet.

Refining Review

The refining industry perhaps has made more progress during the year than it had for the whole preceding decade. Twelve new 100 octane plants are or soon will be in operation in California. Six more are under construction. The new type refineries permit an increased recovery of aviation gasoline of 700% for each barrel of crude, with a resultant decrease of 30% in automotive gasoline and a 10% increase in fuel oil. The so-called 100 octane gasoline of 1943 is also far superior for aviation purposes than the pre-war 100 octane gasoline. Although it is called gasoline, the new aviation fuel is not a gasoline but a new type of fuel produced by rearranging the molecules through the use of catalysts.

Although the actual figures are not for publication, it is estimated that at the end of the year over 50% of California's gasoline supply was being used by the armed forces, whereas the military was consuming 35% of the nation's total supply.

Conclusion

Optimistic estimates indicate that 1500 producing wells will be completed in California in 1944. Naturally this figure is dependent on the availability of proved locations which are becoming increasingly rare. The new locations are expected to be mainly in the Jones sand of the Huntington Beach offshore field; the Ford and Tar zones in the Wilmington field; and in the many zones of the Ventura Avenue field, which has 3000 feet of net sand distributed through 7,000 feet of formation.

Naturally the demand for California oil is expected to increase beyond the already large figure. Continued withdrawals from storage in 1944, especially gasoline, will tend within the year to bring storage to a point below economic levels. Plans are being made to supply some of California's markets from other petroleum provinces. If this is not done, there will be an acute shortage of all products on the Pacific Coast during 1944.

With the experience of 1943, where the completion of 1,155 wells did not increase the maximum efficient rate of production, it cannot be anticipated that drilling during 1944 will increase the present maximum efficient rate of 777,000 barrels daily. Completion of these wells will only serve to offset the natural decline, which is at least 15% per year.

Field Development

Los Angeles Basin

Del Valle Cat Testing

Standard Oil Co. Newhall Land and Farming No. 3-1 is gun perforating and testing by stages below 6000 ft. All tests made to date have shown only salt water with a small amount of oil and gas. Located in section 19-4n-17w, southwest of the Del Valle field, the well was drilled and cored to a total depth of 7636 ft. and a string of 5½ inch casing cemented at 7018 ft. A successful completion at this location would extend the producing limits of the field about one half mile to the southwest.

Dominguez Area Becoming Active

Activity in the area surrounding the Dominguez field is due for a small sized boom during the next few weeks. Off the northeast flank of the field, O. F. Darling is drilling at 204 ft. in Carson No. 1. The location falls in section 35-3s-13w. To the south of the field, in section 8-4s-13w, the Continental Exploration Co. has location staked for Del Amo No. 1, while a little further to the south, in section 17-4s-13w, the Selbar Oil Co. has built derrick for Watson No. 1. The location reported is 1560 ft. south and 1735 ft. east from the centerline intersection of 223rd St. and Avalon Blvd.

Downey Cat Spudded

At the southwesterly outskirts of the town of Downey the Tide Water Associated Oil Co. has spudded Downey No. 10-1. The well is located 786 ft. northeasterly along the centerline of Paramount Blvd. from the centerline of Stewart and Gray Rd. and thence 330 ft. southeasterly at right angles. This location puts the well in section 4-3s-12w. The hole is now being drilled in sand and shale below 2700 ft.

Orange County Test Coring

Northwest of the westerly producing limits of the East Coyote field the Barnsdall Oil Co. is coring ahead in Sunny Hills Ranch No. 1. Located in section 22-3s-10w, the hole is now being cored in brown shale with streaks of oil sand below 6500 ft. The top of the Stearns zone equivalent was found at approximately 6300 ft. The well is unofficially reported to have better than an even chance of discovering a new field in this area.

Outpost Deepening

Shell Oil Co., Orange No. 24, outpost well at the northwest end of the Brea Canyon field, is deepening after making a series of production tests above 1800 ft. The hole was bottomed in shale and gray sand at 1850 ft. and plugged back to 1705 ft. A string of 13⅜ inch casing was cemented at 1640 ft. and a 5½ inch perforated oil string landed at 1705 ft. A series of tests showed fluid entry from this zone to be about 10 barrels gross per day cutting 50 per cent salt water. The 5½ inch oil string has now been pulled and hole is being spot cored ahead in shale and gray sand below 2900 ft.

LOS ANGELES BASIN WILDCATS

Area	Well	No.	Section	Depth	Status
Athens	J. Paul Getty, Westmore	1	2, 3-14		Rigging up
Aliso Canyon	Barnsdall-Bandini Pet. Co., Roosa	1	29, 3-16	6489	Drilling
	Standard Oil Co., Frew	1-2	29, 3-16	9256	Fishing
	Standard Oil Co., Del-Aliso	1	29, 3-16		Grade
Del Valle	Standard Oil Co., N.L. & F.	3-1	19, 4-17	7636	Swabbing
Dominguez	Cont. Expl. Co., Del-Amo	1	8, 4-13		Location
	Darling, O. F., Carson	1	35, 3-13	204	Drilling
	Selbar Oil Co., Watson	1	17, 4-13		Rig
Downey	T.W.A.O. Co., Downey	10-1	4, 3-12	2706	Drilling
El Segundo	E. W. & H. R. Pauley, Loftus	1	11, 3-15	7050	Drilling
Elysian	Seaboard Oil Corp., Park	1	9, 1-13		Location
Loma Verde	Shell Oil Co., Shell-Cont.	86-20	20, 5-17		Location
Newhall	Pet. Expl. Co., Kraft	1	31, 4-15		Location
Puente	Alleghany Pet. Corp., Rowland	1	14, 2-10		Location
Seal Beach	Gilco, Inc., Well	1	10, 5-12		Grading roads
Sylmar	Richfield Oil Corp., T.I.T.	1	19, 3-15	8130	Drilling
Towsley Canyon	Haws & Ellsworth, H. E.	1	8, 3-16	100	Idle
Whittier	C.C.M.O. Co., E.Whittier Comm.	4-1	2, 3-11	4318	Drilling
	Union Oil Co., Sansinena	14	32, 2-10		Rigging up
	Orange County				
Buena Park	Gen. Pet. Corp., Heath	1	34, 3-11	5629	Drilling
Costa Mesa	Lovelady & Frambes, Destiny	1	9, 6-10	1550	Rigging up
East Coyote	Barnsdall O.Co., Sunny Hills Ranch	1	22, 3-10	6754	Drilling
	San Bernardino County				
Chino Hills	Wm. Y. Lee, Corehole	2	21, 2-8	2930	Drilling
Soquel Canyon	A. F. McCain, Soquel	1	6, 3-8		Rig

Southeast of this well in section 6-3s-9w, the Union Oil Co. Stearns No. 84 has been bottomed in shale and gray sand at 4790 ft. The hole was plugged to 2000 ft. and is now being directionally redrilled away from the main Brea Canyon fault.

Tideland Completion

The Huntington State Co. State No. 7, Jones sand well in the offshore pool, flowed at an initial rate of 2400 barrels per day of 19 gravity clean oil thru a 30/64 inch bean with 250 pounds tubing pressure and 335 pounds casing pressure. Gas production was 225,000 cu. ft. per day. The total depth of the hole is 3954 ft. A string of 8⅝ inch casing was cemented at 2340 ft. and a 6⅝ inch liner, including 1497 ft. perforated, was landed at 3946 ft. The well is currently flowing at a 300 barrel per day rate thru a 14/64 inch bean with 300 pounds tubing pressure and 750 pounds casing pressure. The operators next well in the area will be State No. 9, which is located 75 ft. northwesterly from the above well.

Outposts Look Promising

West of the Aliso Canyon field, in section 29-3n-16w, the wildcat wells being drilled by the Barnsdall-Bandini Petroleum Co. and the Standard Oil Co. are looking very promising. The Barnsdall-Bandini Petroleum Co. Roosa No. 1 is coring ahead in oil stained sand and shale below 6000 ft. A body of fair looking oil sand was found from 5600 ft. to 5750 ft. and a second zone from 5750 ft. to 5842 ft. A formation test run on this latter interval recovered 600 ft. of gas cut mud in 28 minutes. Southeast of this well the Standard Oil Co. is drilling ahead below 9100 ft. in Frew No. 3-1. A string of seven inch casing has been cemented below the Sesnon zone at 8850 ft. This well seems assured of being a commercial producer from this zone.

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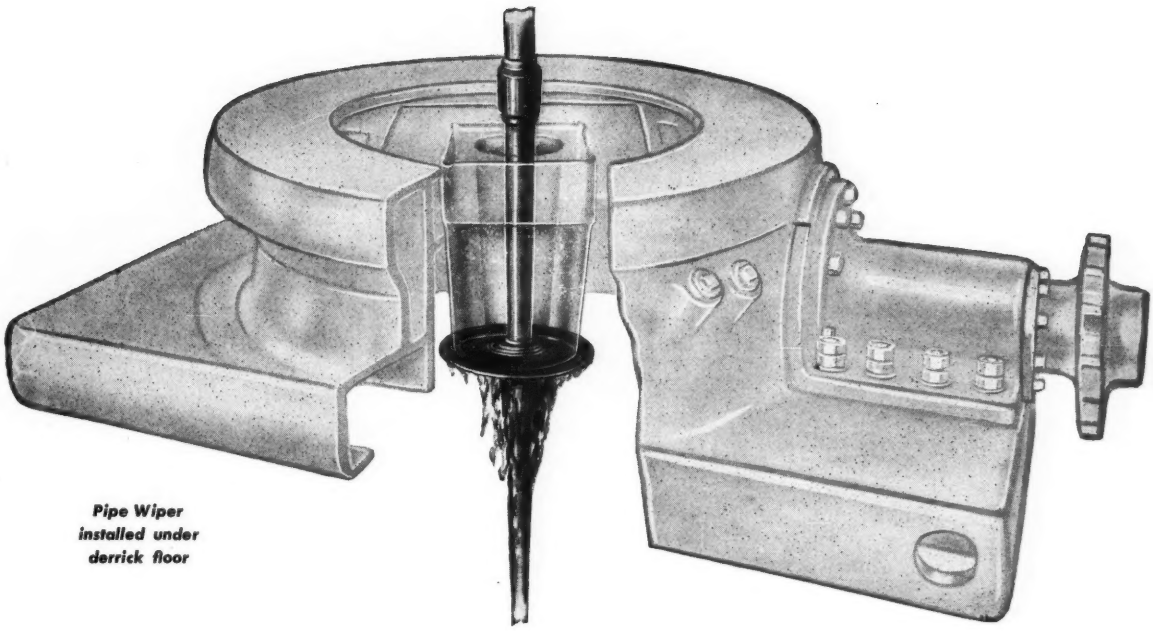

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Coastal and Northern Districts

Deep Test Continues

Northwest of the town of Fillmore, Standard Oil Co. Fillmore Comm. No. 2-1, is drilling ahead below 11,700 ft. No information other than depth has been released by the operator since setting a protective string of seven inch casing at 10,728 ft. However, it is known that there was a considerable showing of gas on the casing head between the seven inch and the 13⅜ inch surface casing. This showing has been eliminated by pumping cement between the strings of casing. The try is located in section 24-4n-20w, approximately one mile northwest of the town of Fillmore.

Outpost Abandoned

The Continental Oil Co. has abandoned Davis No. 1. Located in section 28-10n-33w, the hole was bottomed in Franciscan rocks at 2779 ft. A string of 8⅝ inch casing was cemented at 1650 ft. and 5 9/16 inch perforated liner landed on a plug at 2414 ft. A bailing test was made of the Monterey Chert zone from 1650 ft. to 2414 ft., where the fluid recovery consisted of salt water with a very slight showing of heavy oil. Drilled about one mile east of the easterly producing limit of the Santa Maria Valley field, the hole found the top of the Sisquoc at 1560 ft., top of the Chert at 1640 ft. and top of the Franciscan at 2738 ft.

New Test For Los Alamos Area

In the Los Alamos area of Santa Barbara county, the J. I. Anderson and Southern California Petroleum Corp. partnership has derrick erected for Archambeault No. 1. The try is located in section 3-7n-32w, about 1½ miles northwest of the Whittier Associates well, Barham No. 1. This well has pumped an average of 15 barrels per day of 14 gravity oil from the plugged depth of 3059 ft. It is believed that the wells are both located on the same structure.

Standard to Drill Holser Canyon "Cat"

The Standard Oil Co. has derrick erected for Bowman No. 1, on section 14-4n-18w, south of the Holser Canyon field. The location reported is 330 ft. north and 330 ft. west from the south ¼ corner of section 14 about ¾ of a mile southwest of the operator's easterly extension well, Crestmont No. 1.

Sespe Well Completed

In the difficult terrain of the Sespe Creek field, the Merchants Petroleum Co. has recompleted Cochran No. 7. Hole was redrilled and deepened from 980 ft. to 1769 ft. and bottomed in oil sand. A combination oil string of seven inch casing was hung at 1700 ft. with perforated intervals from 500 ft. to bottom. Recompleted on pump the well produced 168 barrels per day of 17 gravity cutting 50%. The well is located in section 1-4n-20w.

G. P. Completes Tideland Well

In the tideland section of the Rincon field General Petroleum Corp. has completed Ferguson No. 17. Located on the pier a considerable distance offshore, the hole was cored to a total depth of 2575 ft. and completed from the Upper Miley zone. Initial production was gauged at 180 barrels per day of 29 gravity clean oil flowing thru a 13/64 inch bean. The hole was bottomed in gray sand and plugged back to 2574 ft., where a string of 8⅝ inch casing was cemented at 2547 ft. and a 5¾ inch pre-gravel packed, perforated liner landed at 2574 ft. No. 18 is already under way and the operator is reported to have locations for ten additional wells in this field.

BUY WAR BONDS

COASTAL COUNTIES WILDCATS

Area	Well	No.	Section	Depth	Status
	Santa Barbara County				
Lompoc	S. R. Williams, Fickert	1	8, 7-33	2264	Drilling
Los Alamos	J. I. Anderson & Co., So. Calif. Pet. Co., Archambeault	1	3, 7-32		Bldg. rig
	Ventura County				
Camarillo	Camarillo Oil Co., Camarillo	2	32, 2-20	2647	Idle
	Jos. Schuck, Schuck	1	28, 2-20	749	Drilling
Fillmore	Standard O. Co., Fillmore Comm.	2-1	24, 4-20	11767	Repairing
Happy Camp	Cal Camp Oil Corp., Harrington	1	21, 3-19		Location
Oxnard	Exeter Oil Co., Ltd., Lennox	2	6, 1-21	2572	Rng. tubing
	Hub City Pet. Co., Chase	1	6, 1-21	1955	Idle
Piru	Standard Oil Co., Bowman	2-1	14, 4-18		Bldg. rig
Santa Paula	J. J. Stevens, Corehole	1	31, 4-20	2745	Drilling
Sespe	Merchants Pet. Co., Cochran	7	1, 4-20	1768	Pumping
	Volunteer Pet. Co., Tar Creek	3	28, 5-19	2019	Drilling
Shiells Canyon	Los Nietos Co., Elkins	2-1	5, 3-19	2989	Completing
Simi	Mayo Oil Co., Montgomery	1	16, 2-18	2570	Idle
South Mt.	Cambria Oil Co., Well	1	13, 3-21		Location
	F. E. Fairfield, S. M.	1	19, 3-20	4991	Idle
San Luis Obispo	Arroyo Grande Los Nietos Co., Scott 2	5	32-13		Rigging Up
Timber Canyon	Geo. H. Roberts, O'Leary	1	29, 4-20	380	Drilling

NORTHERN COUNTIES WILDCATS

County	Well	No.	Section	Depth	Status
Butte	Richfield Oil Corp., Dayton Comm.	2-1	6, 21n-1e		Foundation
Glenn	Richfield Oil Corp., Afton Comm.	1	2, 18n-1w	5242	Completed
	Superior Oil Co., Capay Grant	1	12, 21n-2w	3993	Completed
		2	13, 21n-2w	762	Drilling
Humboldt	Br.Am.O. Prod. Co., Mitchell-Dorr	1	10, 3n-1w		Rigging up
Sacramento	Amerada Pet. Corp., McGillivray	1	29, 5n-5e		Rigging up
San Joaquin	Richfield Oil Corp., East Stockton	1	5, 1n-8e	8544	Testing
Solano	Standard Oil Co., Honker Comm.	1A	25, 3n-1w	8304	Testing WSO
	Standard Oil Co., A. O. Stewart	1	25, 3n-1w	8728	Fishing D.P.
	Standard Oil Co., Suisun Comm.	3	5, 3n-1w		Drilling Island
Tehama	Gen. Pet. & Union Oil Co., Dolan	1	33, 23n-3w	3589	Drilling
	Richfield Oil Corp., Gallatin	1	26, 25n-3w		Rig

Richfield Completes Glenn County Gasser

In Glenn County, two miles east of Butte City, the Richfield Oil Corp. has completed Afton Comm. No. 1-1 on sec. 34-19n-1w. The hole was bottomed in shale at the total depth of 5242 ft., plugged back and a string 4½ inch casing cemented at 3480 ft. This casing was gun perforated from 2648 ft. to 2660 ft. and string of two inch tubing hung at 2675 ft. Currently shut in under 1120 pounds equalized pressure, the well flowed 6,200,000 cu. ft. of gas through a 42/64 in. bean.

Ord Bend Gas Field Extended

The Superior Oil Co. has completed the second well in its Ord Bend gas field when Capay Grant Comm. No. 1 flowed at an initial rate of 4220 MCF per day of dry gas thru a 24/64 inch bean with 1220 pounds tubing pressure and 1210 pounds casing pressure. The well is now standing shut in with pressures equalized at 1525 pounds. The hole was bottomed in shale at 3993 ft. after finding the gas sand at 3670 ft. A string of 5¾ inch casing was cemented at 3750 ft. and gun perforated from 3675 ft. to 3680 ft. The well is located in section 12-21n-2w about ½ mile north of the discovery well, Knight No. 1. A third well is already under way in the field.

Richfield Stakes Tehama Test

In Tehama County, midway between the towns of Corning and Tehama, the Richfield Oil Corp. is preparing to drill Gallatin No. 1. The location falls 625 ft. north and 3750 ft. east from southwest corner of projected section 26-25n-3w. The company is reported to have leased up a very large block of acreage in the area.

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San Joaquin Valley

Standard Completes Jacalitos Gas Well

Approximately one mile south of the southerly producing limits of the Coalinga field, well No. 67-17E, has been completed by the Standard Oil Co. as a gas well. Located in section 17-21s-15e, the hole was drilled and cored to a total depth of 5540 ft. Top of the Kreyenhagen was found at 3940 ft., top of the Eocene at 4800 ft. and top of the Cretaceous at 5080 ft. The hole was plugged back, 5½ inch casing cemented at 3960 ft. and gun perforated in two stages between the depth of 3700 ft. and 3760 ft. The well blew at an initial rate of 3,500 m.c.f of dry gas, through a 40/64 inch bean with 580 pounds tubing pressure and 950 pounds casing pressure. The well is now standing shut in with a pressure of 1100 pounds on both the tubing and casing.

Polvadero "Cat" Coring Sand

The Standard Oil Co. Bourdieu No. 1-A, wildcat test north of the northwesterly producing limits of the Kettleman Hills North Dome field, is coring ahead in hard tight sand below 10,400 ft. Top of the Eocene sand was found at 10,260 ft. with good oil sand reported from 10,332 ft. to 10,342 ft. A string of seven inch casing was cemented over this sand at 10,320 ft. The operator is now coring ahead to take a look at the Cretaceous before attempting to place the well on production.

Greeley Completion

Standard Oil Co's. KCL No. 11-40, located in Section 18-29s-26e, has been completed for an initial production of 1275 barrels per day of 36 gravity clean oil. The initial flow was thru a 24/64 inch bean with 1395 pounds tubing pressure and 950 pounds casing pressure. The hole was drilled to a total depth of 11,510 ft. A string of 7 inch casing was cemented at 11,398 ft. and a 4¾ inch perforated liner landed at 11,508 ft. North of this well in section 1-29s-25e, the General Petroleum Corp. has abandoned Mitchell No. 3. Located on the northeast flank of the field, the hole was bottomed at 11,612 ft. and abandoned after a series of tests below 7500 ft. showed only water with a small amount of oil.

Tejon Field Wells Work

The Richfield Oil Corp. is now using three strings of tools in the development of its recently discovered Tejon field. North of the discovery well, in section 35-11n-19w, Tejon No. B-54-35, is coring ahead in gray sand and shale below 4000 ft. Top of the Chanac zone was cored at 2360 ft. and top of the Santa Margarita sand at 2585 ft. Both zones were wet and the operator is coring ahead to take a look at the Reserve sand. Southeast of the discovery well Tejon No. A-78-35, is coring ahead below 2130 ft. in green gray shale. The top of the Chanac oil sand was found at 1923 ft., which makes this well the structurally highest in the field to date. Approximately four miles north of these wells, in section 7-11n-18w, Tejon No. B-65-7, is drilling ahead in gray sand and clay at 2223 ft.

Fruitvale Activity

During the last few months this old field has seen considerable new activity with five to ten strings of tools running constantly. The Western Gulf Oil Co. is carrying most of the load with five strings running. On the Red Ribbon lease in section 27-29s-27e well No. 17, preparing to gun perforate a 7 inch string cemented on bottom at 4425 ft. Locations have been staked for No. 22 and 23. In section 21-29s-27e, Neumann No. 1 has been bottomed

SAN JOAQUIN VALLEY WILDCATS

Fresno County					
Cantua	Standard Oil Co., Well	88-3	3, 17-14	611	Drilling
Coalinga	The Texas Co., S. P.	58-21	21, 19-16	9416	Fishing D.P.
Polvadero	Standard Oil Co., Bourdieu	1A	1, 21-16	10469	Drilling
Raisin City	Herndon, Sam, Well	1	13, 15-18		Location
Kern County					
Ant Hill	Shell Oil Co., Afana	1	18, 29-29	1143	Stdg. cem.
Bowerbank	The Texas Co., Bowerbank Unit II	8B	8, 29-24	4949	Fishing D.P.
Comanche Point	T. W. Burnham, Chiquita	2	34, 12-19	2250	Idle
Devils Den	Priest & DeKalb, Blake	1	25, 25-18	900	Drilling
Elk Hills	Capital Co., Tupman	1	24, 30-24		Location
Edison	Seaboard Oil Co., Garrison-Davis	2	30, 29-29		Location
	Wilshire Oil Co., Cardoza	1	7, 30-29		Location
Edison, SE	Judy K Oil Co., El Tejon	1	22, 30-30	1750	Drilling
Fruitvale	The Texas Co., KCL	1	26, 29-27		Bldg. rig
Gould Hills	Union Oil Co., Richardson	53	18, 29-21	3978	Pumping
Grapevine	Kern Line Oil Co., Well	1	19, 11-19	9200	Milling window
Jasmine	Western Gulf Oil Co., Quinn	1	8, 25-27		Location
Kern Bluff	Standard Oil Co., Well	2-10	21, 29-29	1363	Pumping
	Standard Oil Co., Well	6-6	29, 29-29	866	Drilling
Kern Front	Independent Expl. Co., Austin	1	28, 28-29		Location
Kern River	E. A. Bender, Orloff	1	6, 29-28	1922	Abandoned
	Seaboard Oil Corp., Fuhrman	1	21, 28-28	3328	Abandoned
	J. T. Wilcox, Zanetti	1	17, 28-28	3440	Rerigging
McKittrick	Superior Oil Co., F. & W.	1	23, 29-21		Rigging up
Midway	Std. Oil Co., Ethel D.S.	1	36, 12-24		Rigging up
Mt. View	T.W.A.O. Co., Porter	24-18	18, 30-29		Bldg. rig
Poso Creek	Grandell Oil Co., K-C	6	10, 27-27		Rig
Richgrove	Western Gulf Oil Co., Richgrove	1	4, 25-27	2954	Abandoned
Rio Bravo	Union Oil Co., Kerneo	88-8	8, 29-25		Rigging up
Rosedale	Western Gulf Oil Co., KCL-A	37-14	14, 29-26	824	Drilling
Round Mt.	Bandini Pet. Corp., Signal Mills	5	24, 28-28	2790	Redrilling
	Gen. Pet. Corp., Railroad	4	23, 28-28	2539	Drilling
	Hall, E. B. & Co., Russell	1	6, 28-29	400	Drilling
	Signal Pet. of Calif., S. P.	1	25, 28-28	826	Drilling
	The Texas Co., KCL	1-13	13, 28-28		Location
	Wilshire Oil Co., Hartfield	1	32, 28-29		Grade
Shafter	T.W.A. Oil Co., Shafter Comm.	86-7	7, 28-25	11092	Drilling
Stockdale	W.G.O. Co., KCL	77-5	5, 30-27		Rig
Tehachapi	E. G. Cummings, Poor Boy	1	31, 32-32	1411	Idle
Temblor	B. F. Delanty, Well	69-A-1A	36, 29-20	260	Drilling
10 Section	Ohio Oil Co., KCL	J-1	6, 31-26	2340	Drilling
Madera County					
Herminghaus	The Texas Co., Gill	41-17	17, 13-16		Location
Firebaugh	The Texas Co., Moffat	55-7	7, 12-15		Rig

at 4623 ft. and is flowing 147 bbls. of 17.0 gravity oil daily. On the KCL-A lease in section 22-29s-27e, No. 2-1, was completed from the plugged depth of 3400 ft. for an initial production of 85 barrels per day. No. 2-2 is coring ahead in oil sand below 3775 ft. On the KCL-B lease No. 21, is redrilling through 8⅝ inch casing below 3475 ft. and Price and Stewart No. 5, on the same section, is sidewall sampling after bottoming in gray sand at 4560 ft. Mohawk Petroleum Co., Fruitvale No. 2, section 27-29s-27e, has been bottomed at 4375 ft. and is making a production test of the zone from 3711 ft. to 4290 ft.

In section 26-29s-27e, P. M. Girard Signal-Anderson No. 1 is running casing after reaching 4572 ft., while Signal-Bowman No. 1 is making a production test several perforated zones between the depths of 4465 ft. and 3314 ft. This operator is also making a production test in Signal-Tieck No. 1, an outpost well on section 13-29s-27e. The total depth is 3126 ft. with the current open zone open at intervals below 2645 ft. At press time the well was reported blowing a light rate with a spray of oil.

Texaco Drills at Fruitvale

The Texas Co. is building rig for KCL-Fruitvale No. 1, 1917 ft. south and 1266 ft. east from the north ¼ corner of section 26-29s-27e. This location is in the west end of Bakersfield approximately ½ mile southeast of the easterly producing limits of the Fruitvale field. The hole is being drilled to test the Eocene sands, which at this location will probably not be found above 10,000 ft.

Standard Pumps Kern Bluff Well

Approximately one mile north of the town of Edison, the Standard Oil Co. is pumping 8 to 10 bbls per day of 13.5 gravity oil from Corehole No. 2-10. Located in section 21-29s-29e, the hole was bottomed at 1363 ft. and plugged to 1014 ft., where a combination string of 5½ inch casing, including 22 ft. perforated was landed at 1012 ft. and cemented through perforations at 889 ft.

Shark Tooth Development

Bandini Petroleum Corp. Signal-Mills No. 5, section 24-28s-28e, bottomed in gray sand at 2790 ft. and is directionally redrilling from 1764 ft. Top of the Vedder sand was cored at 2533 ft. but was all gray with the exception of a few oil stains at the top. West of this well, in section 24-28s-28e the General Petroleum Corp. completed Railroad No. 3, for an initial production of 213 barrels per day of 14 gravity oil cutting 6% water and mud. The total depth is 2503 ft. with 8⅝ inch casing shut off at 2483 ft. The operator's Railroad No. 4 is coring ahead below 2530 ft. South of these wells, in section 25-28s-28e, the Signal Petroleum Co. of Calif. is drilling below 800 ft. in its S. P. No. 1.

Continental Trys Terra Bella Area

Continental Dev. Corp. drilled and abandoned a Corehole on its large holdings in the Terra Bella area of Tulare County.

The try, Corehole No. 1-11-2 on sec. 11-23s-27e, went on the hook at 779 ft. after bottoming in coarse green water sand.

Texaco Cat Showing Gas

In the Bowerbank area of Kern county, The Texas Co. Bowerbank Unit II No. 8B, is fishing drill pipe after blowing out and sanding up. Located in section 8-29s-24e, the well was bottomed in shale at 4949 fr. after finding the top of the Mulinia zone at 4672 ft. The hole was plugged back preparatory to setting casing. While cleaning out cement the old hole was sidetracked and while redrilling at 4783 ft., the blow out occurred. Attempts to weight down strong gas showings during the redrill were consistently made. The try is located about six miles northeast of the town of Buttonwillow, where the operator has already drilled four shallow wells in search of the gas sand which is produced in the Buttonwillow gas field.

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THIS LAUGH

OFF!!

When the grandfather of a German family died, his sorrowing relatives put the usual announcement in the local newspapers. It ran:

"Ernest Muller has been called into a better world."

The next day the family was arrested for criticizing the nazi regime.

Mandy: "Ah'd like a little vacation, Missus. Ah wants to go home and see mah chillun."

Mistress: "Why, Mandy, I didn't know you were married."

Mandy: "Well, ah ain't, Missus. But ah ain't been neglected."

A farmer and his wife went to a circus and saw a beautiful lady lion tamer. In the act, she made the ferocious beasts do everything but talk, and climaxed the performance by having the largest and fierest looking lion walk over and kiss her.

"Gosh, Zeb," ejaculated the farmer's wife. "Ain't that wonderful!"

"Nuthin' at all," says Zeb. "I cud do the same.'

"What," countered the spouse, "you do that? You're crazy!"

"Not me," says the apple knocker. "Just have that gal get them lions out of there, an' I'll show yuh."

"You know, you're not a bad looking girl."

"Oh, you'd say so even if you didn't think so."

"We're even then. You'd think so even if I didn't say so."

One man who has been a sergeant in the army for more than a year was challenged by a friend, who demanded to know why he had not become a second lieutenant.

The sergeant smiled.

"Remember the last war?" he asked. The other did.

"Remember Serg. York?" asked the sergeant. The other man nodded.

"Chum," said the sergeant, "just name me one of the second lieutenants in that war."

Hee: Mother used to dust off her shoes on her stockings where it wouldn't show.

Haw: A girl that could do that today should join a circus.

The poor duck hunter in his blind
Is chilled in front and wet behind!
It's seven hours since he fed,
And twenty since he's been to bed.
It's cost him nearly a hundred bucks
To hide here from the silly ducks,
Which presently, ere day dawns dim,
Will rise and hide themselves from him!

A man went into a bar and ordered a Martini, drank it, chewed the bowl of glass up and threw the stem over his shoulder. He continued this for about six Martinis and noticed that the bartender was staring at him.

"I guess you think I'm crazy don't you?" he asked.

"I sure do," replied the bartender, "the stems are the best part."

Copper: "You were doing 60 miles an hour."

Sweet Young Thing: "Oh, isn't that splendid. And I only learned to drive yesterday."

A sailor was cast away on a desert island. After he had been there for nine years, he awoke one morning and saw a lovely young woman floating toward the beach on a barrel. The barrel washed ashore and the woman approached.

"Hello," she said. "How long have you been here?"

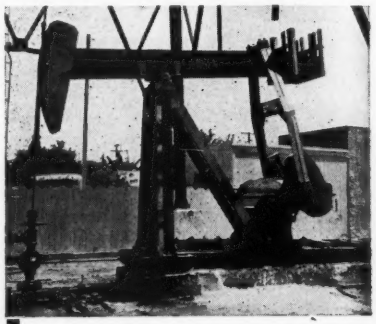
"Nigh onto 10 years," said the sailor.

"Gracious," said the woman. "Then I shall give you something you certainly haven't had in a long time."

"Well, bust my leg!" exclaimed the sailor. "Don't tell me you got beer in that barrel!"

"Mandy, I've been sent to see you because you have 12 children and I want to give you this booklet on birth control."

"Yass'm, Miss Sanger dat mout be all righ fo' yo' unmahried ladies, but I'se mahried and don't need it."



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Tuthill Joins Kelite Products Staff

J. Burke Tuthill has joined the Los Angeles laboratory staff of Kelite Products, Inc., to take up a research assignment in specialized applications of pH Control to metal processing and cleaning.

J. B. Tuthill

Mr. Tuthill, formerly an independent mining engineer, went to Kelite from the Utah Ordnance Plant of Remington Arms Co., where he had been working as Control Chemist since the start of the war.

Hycar's Synthetic Rubber Glossary Now Available In Printed Form

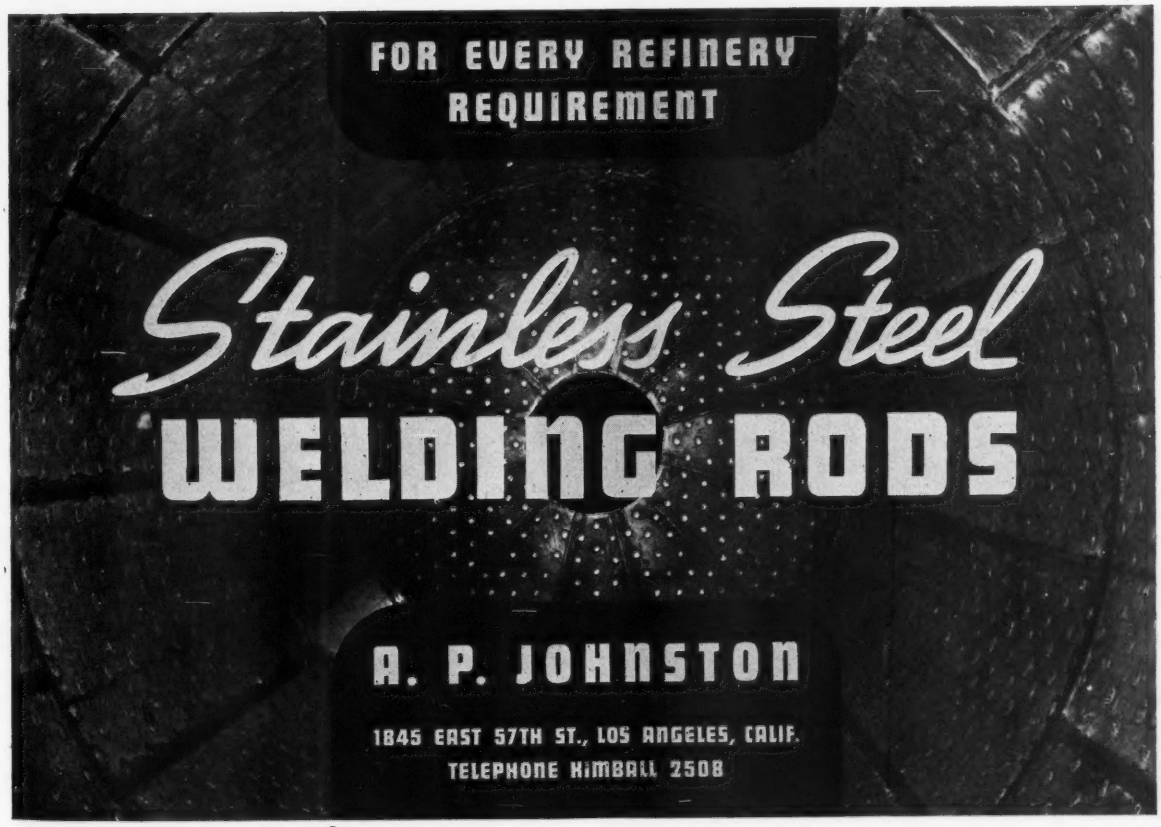
To meet unexpected demands for its glossary giving pronunciations and meanings of synthetic rubber words, Hycar Chemical Company, largest private producer of butadiene-type synthetic rubber, has had this information printed as a 5½-inch by 8½-inch, 8-page pamphlet.

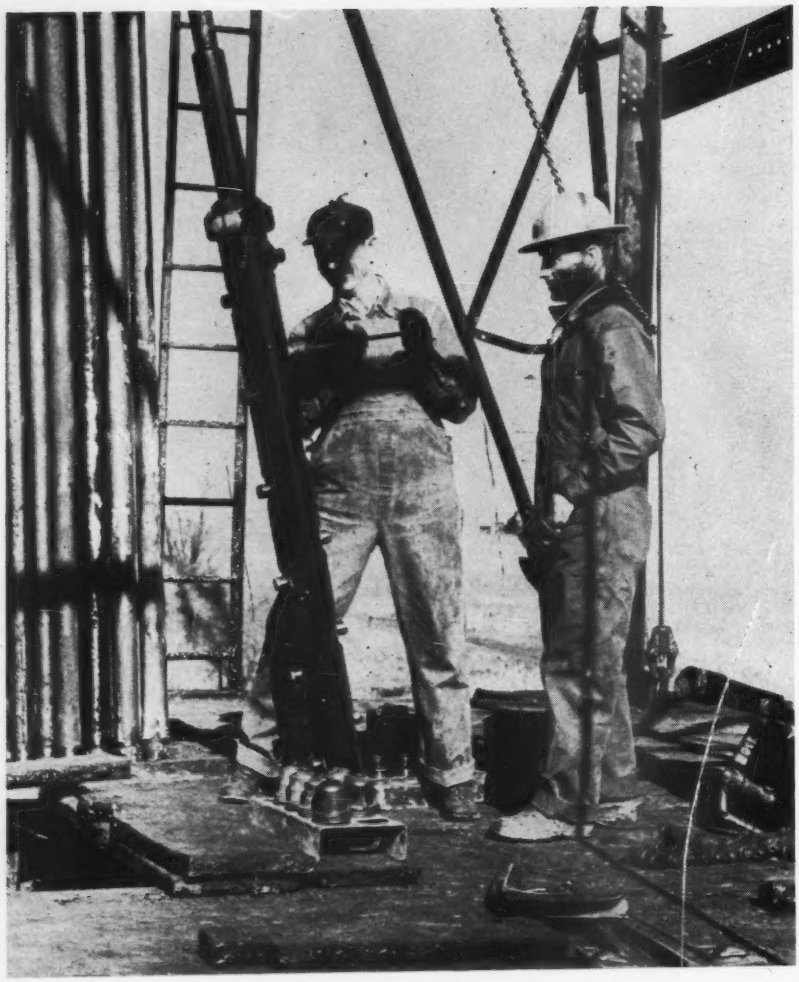
The preface of the booklet states that it is designed to help business, industrial and sales executives and their associates in discussion of this subject and is not a highly scientific treatise. It is further pointed out that the glossary is by no means complete, but includes only the more common chemical terms and some of the well established trade names.

Hycar Chemical Company produces crude synthetic rubber in various grades and types, specializing in those which are highly resistant to petroleum products, heat and abrasion, for a wide variety of industrial applications. The company makes no finished rubber products, but furnishes the crude material to many leading rubber manufacturing companies, who in turn compound and process it into a multitude of extremely valuable products.

Established in 1940, Hycar was a pioneer in the development of oil resistant synthetic rubbers from butadiene and has been instrumental in working out many interesting applications in various industries. While Hycar products have been confined to the most critical war materials for the past two years, they were well established long before Pearl Harbor, and it is hoped will soon be once more available for general use.

Copies of this booklet entitled "Chemical Names and Terms Frequently Encountered in the Synthetic Rubber Industry" may be obtained by writing the company at Akron, Ohio.





On January 19th, Lane-Wells field crew gun perforated the 50,000th successful job for Cities Service Oil Co. in the Oklahoma City Field. Here a Cities Service crew man and Lane-Wells rigman, Walter Grimes, load the gun for the historic run.

Lane-Wells Gun Perforates 50,000th Oil Well

On Wednesday, January 19, Lane-Wells Company completed its 50,000th successful gun perforator operation in the Nettie Emerson No. 10, Oklahoma City Field for the Cities Service Oil Company.

The achievement which marks the beginning of Lane-Wells' twelfth year as a petroleum industry service company was attended by Walter T. Wells, Chairman of the Lane-Wells Board and Rodney S. Durkee, president, as well as Earl Ives, H. O. Harder, D. B. Dow and Fred Lichtenheld of the Cities Service Oil Co.

During the eleven years since Lane-Wells Company introduced the service, the Gun Perforator has profoundly influenced many of the standard oil field practices throughout the world.

Originally designed for "plug-back" operations to test old wells before abandonment, Lane-Wells gun perforator is now used for selective completion, acidization, control of gas/oil ratio and water shut-off.

The gun perforator made possible completions of oil wells with a great reduction in steel required. Through use of the service it is now possible to get maximum production of oil from a well at considerably lower cost.

How much additional oil has been recovered by use of the gun perforator is impossible to estimate because oil companies will not divulge the figure. More than 96% of the oil producing companies are customers of Lane-Wells Company. War demands for petroleum products and restrictions of steel for casing wells has accellerated the company's business to the point where the 1943 gross revenue is more than $5,000,000.

Lane-Wells perforated its first well on Dec. 12, 1932, at the Union Oil No. 17 La Merced, at Montebello, The well had been dead and temporarily abandoned for three years. It has produced 165,000 barrels of oil since perforaing.

The 25,000th well was perforated April 2, 1940, at the Union Oil No. 33 Hellman, at Dominguez, Calif. The first 25,000 wells were perforated in a period of 2,666 days, or nine per day.

The second 25,000 wells were perforated in 1,385 days, or at the rate of 18 per day. The 50,000th well came 4,051 days after the first job, or at the rate of 12 per day.

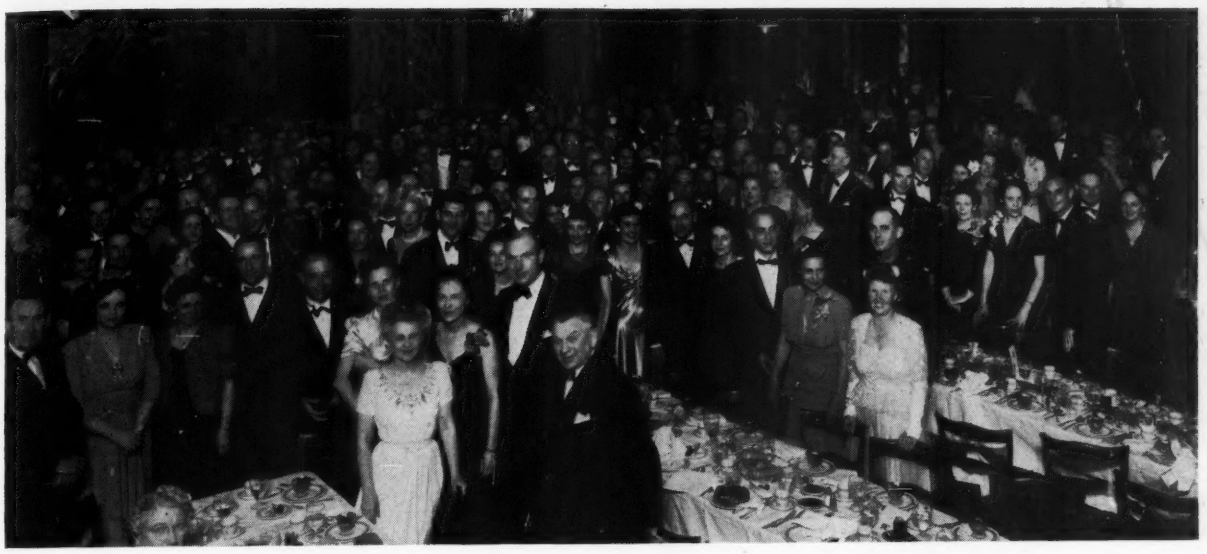
The Cities Service Oil No. 10 Nettie Emerson, in SE NE SW of 30-11n-2w, at south end of the Oklahoma City field. The well originally was drilled by the I. T. I. O., field discoverer. Some of the former I. T. I. O. men were there to see the new job

Originally drilled to 6,392 feet, the well was plugged back to 5,387 feet, produced 64,000 barrels of oil, and was considered exhausted. It was plugged back to the Hoover sand zones, perforated first on June 10, 1938, and a second time in the same zone on July 15, 1939, and has produced 183,000 barrels of oil to date. Now is doing four barrels of oil and 44 barrels of water a day.

Ohio Spuds Ten Section "Cat"

The Ohio Oil Co. KCL No. J-1, spudded in and is now drilling ahead below 1000 ft. The hole is located 1650 ft. south and 2310 ft. east from the northwest corner of section 6-31s-26e, approximately one mile south of the Ten Section field. The Richfield Oil Corp. drilled a 10,000 ft. dry hole in this section about three years ago.

BUY WAR BONDS



Fifth Annual Inaugural Ball

Los Angeles Chapter of Nomads February 5th

Over three hundred Nomads and guests attended the Fifth Annual Inaugural Ball of the Los Angeles Chapter of Nomads held at the Biltmore Hotel, Saturday, February 5, 1944. This was the greatest attendance in the history of the Chapter and the Renaissance Room had to be used in addition to the Rendezvous Room, which was originally scheduled for the dinner dance, in order to handle the crowd.

The Ball was in honor of the outgoing and incoming officers and regents who were:

OUTGOING OFFICERS

Henry W. Pullman, President; Roland E. Smith, Vice-President; Wallace A. Sawdon, Secretary; Thomas M. Martin, Assistant Secretary; Elmer R. Smith, Treasurer; Roger Henquet, Assistant Treasurer; Fred Tyler, Sergeant-at-Arms; L. George Trembley, Deputy Sergeant-at-Arms.

REGENTS

Wilbur F. Bettis; Walter R. Martin.

INCOMING OFFICERS

Roland E. Smith, President; Wallace A. Sawdon, Vice-President; John C. Ballagh, Secretary; John Dodge, Assistant Secretary; Elmer R. Smith, Treasurer; Fred Tyler, Assistant Treasurer; William McGraw, Sergeant-at-Arms; Thomas M. Johnston, Deputy Sergeant-at-Arms.

REGENTS

Wilbur F. Bettis; Henry W. Pullman.

After the introduction of officers, Nomad George Anderson sang a song entitled "Margaret's Road." The song was a poem written by Billy McGraw, Poet Laureate of the Nomads, that had appeared in the "Flying Carpet," the official publication of the Los Angeles Chapter of Nomads. The music was written for the lyrics by Freeman High who was a guest at the Ball.

The affair was most ably handled by the Arrangements Committee which consisted of: Fred Tyler, Chairman; Norman Dorn, Ray Humphreys, Pete Maxfield, Reed O'Neil, Elmer Smith, George Trembley.

Officers, Los Angeles Chapter of Nomads—Left to right, sitting: Henry W. Pullman, Regent; Roland E. Smith, President; Wilbur F. Bettis, Regent. Standing: Wallace A. Sawdon, Vice President; Elmer R. Smith, Treasurer; Thomas M. Johnston, Deputy Sgt.-at-Arms; Fred Tyler, Asst. Treasurer; William McGraw, Sgt.-at-Arms; John C. Ballagh, Secretary.

(*Continued from Page 34*)
reserve,—why bother with a remote, undrilled, untested spot that can be reached only by airline?

Well, Mr. Poulson points out that, after the war, Fairbanks will be a "junction stop" en route to China, India, Australia and the Near East. It will also be a refueling stop . . . He's thinking about the "Great Circle Route"—more closely connected with Russia than most Americans realize . . . . And the "peace-table talks," — when we are supposed to tip our hands as to the mighty reserves the U. S. holds, in comparison with other nations.

A bit of research helped develop the Point Barrow idea. Recognized experts admitted that Poulson "had something." However, they were skeptical about the prospects of cranking up the Navy to develop its No. 4 reserve . . . Aerial photos and other research showed that, just outside the reserve, there were lands even more promising than the Navy's 35,000 square miles and the eight major anticlines included therein. Tempting to private industry, if the Navy Department still felt it was necessary to keep its oil products "locked in the ground" against a rainy day.

Development of 35,000 square miles of productive oil fields — or more than 22,000,000 acres—is completely within the jurisdiction of the U. S. Navy Department. But some experts believe that lands outside the Navy reserve show even better promise of a new oil "bonanza" . . . The question seems to be: Who wants to brave the unpleasant Alaska weather, the present shortage of materials, etc., and stake out a section of the outlying oil reserves?

All of this brings us back to Elk Hills, — where the Congress, the Navy Department, and Standard of California are still see-sawing about a new contract that will permit Standard to operate (at 15,000 barrels per day) the Elk Hills lands it owns, while Navy holds the whip-hand over present and future production. The picture, recently, has looked much brighter for Standard — which faced condemnation proceedings threatening to strip it of its holdings in Reserve No. 2.

Increasing shortages of oil on the Pacific Coast, plus the fact that a huge trans-Pacific "push" is building up under the very noses of Pacific Coast residents, point the way toward an urgent need for accelerated production. Public sentiment also is swinging toward any plan that would put into effect a program that would take the "stored" resources of the government—such as the Naval Oil Reserves—for the war effort and permit private enterprise to continue production of sadly-needed civilian oil and gasoline supplies.

The House Public Lands Committee—which has been browsing over the possibilities of condemning Standard's properties—has suspended its hearings for the moment. The House Naval Affairs Committee is expected to take up the problem as soon as it has before it legislation authorizing a new contract between Navy and Standard,—drawn up after the Department of Justice requested abrogation of a previous "business agreement" between the two.

Considerable pressure—including a formal request by Petroleum Administrator Ickes for an increase to 50,000 barrels per day in the production from Elk Hills—has been brought to bear in the past few weeks. Because the Naval Oil Reserves, by Congressional decree, were set aside for war-time emergencies—such as we face today—it is being argued the additional production needed for the West Coast should be taken from dormant supplies presided over by the Navy Department.

* * *

The price situation? Some signs point to a more realistic understanding on the part of the Government in this quarter. The most recent encouragement for an increase in crude prices comes from the much-quoted Truman Committee report.

Although dealing almost entirely with foreign oil problems, the report says—rather rebukingly:

"If it were decided to increase the price of petroleum and petroleum products, we might reasonably expect to discover some aditional reserves."

With at least six Congressional committees plugging for a price increase and numerous lawmakers sounding off on the injustice that has been done the oil industry by pegging prices far below the "national index," some hope is held out for a price boost despite the animosity showed by Economic Stabilization Director Vinson and the Office of Price Administration toward any up-trend in returns.

Furthermore, War Mobilization Director Jimmy Byrnes — so-called "Assistant President" — is rumored to have taken the matter into his own hands with a view to possibly upsetting the Government factions which have been holding out for subsidies vs. price increase . . . But this vital subject will have to wait for the March issue of CALIFORNIA OIL WORLD (if not for the April or May issue) for a final solution.

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